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COMPANION

TO THE

BOTANICAL MAGAZINE;

BEING

A JOURNAL,

CONTAINING SUCH INTERESTING BOTANICAL INFORMATION AS DOES NOT COME WITHIN THE PRESCRIBED LIMITS OF THE MAGAZINE; WITH OCCASIONAL FIGURES.

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COMPANION

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BOTANICAL INFORMATION.

Mr. George Gardner, whose intention of visiting South America as a Botanical Collector has been noticed at p. 226 of this Journal, embarked from Liverpool on the 20th of last month (May) for Rio de Janeiro. The Organ Mountains, so rich in orchideous plants, will probably be the spot where he will commence his researches; but the chief field of investigation will not be fixed till his arrival in Brazil, and will depend much on the information and assistance he will obtain from influential persons, to whom he is favoured with letters of introduction. Preference will of course be given to those parts of South America which have been the least explored by the Botanist. Few Naturalists have gone to South America under more favourable auspices, and the number of names of such Botanists as intend taking collections of specimens from him, at the moderate rate of £2 the hundred species, is already considerable, so that we have every reason to believe he will meet in the fullest extent with the encouragement to which his great enthusiasm so justly entitles him. The specimens, ticketed in all the collections, will be marked with corresponding numbers, which numbers will be referred to when the lists of the species come to be published: as they will be with all convenient speed.

The beautiful *"Musci Britannici,"* or Pocket Herbarium of specimens of British Mosses, was published a little while previous to the Author's departure for South America; and it makes a most valuable and important addition to the works on British Cryptogamic Botany. The pages of an 8vo. volume (bound like a pocket-book) are marked into compartments, suited to the size of the different kinds, and in each the generic and specific names are given, corresponding with the arrangement of the British Flora: and every Moss that Mr. Gardner has been able to procure is neatly fastened in its proper place; so that the whole may be turned over, and the different species referred to with the same facility as if the page contained so many engravings of the species. The number of species in the work varies in different copies, from two hundred to two hundred and fifty. As the number of copies is necessarily limited, and many were subscribed for, previous to the time of publication, very few are undisposed of. Those that remain are left for sale at the Glasgow Botanic Garden, and may be obtained by applying to Mr. Stewart Murray, Curator of that Institution.

The indefatigable Dr. Schomburgk is prosecuting his geographical and botanical researches in the interior of South America. His last letters were dated "Brooh Curassanack, in 3° 50′ N. L., 58° 35′ W. L., (a stream, we believe, which flows into the Rupunnuny,) 3rd of February, 1836. He has dispatched a collection of cryptogamic plants to this country for distribution, and intended leaving the Rupunnuny during the month of March, and descending lei-

surely the Essequibo, so as to increase his collections to the utmost of his power.

NOTICE RESPECTING THE UNIO ITINERARIA, ADDRESSED TO THE MEMBERS.

"The distribution of the Arabian specimens of plants, collected by M. Schimper, in the valleys and mountains of Sinai, is now proceeding; but in order not to keep the share-holders too long waiting, we intend to despatch immediately the first century of them, as a precursor of what may be expected to follow in the course of the summer, or towards autumn. There will be three centuries more, consisting chiefly of the productions of Arabia Petræa, with the addition of some interesting Egyptian plants, collected by the late Dr. Wiest, in the deserts round Cairo and as far as the Pyramids, during the months of February, March, and April. M. Gay, at Paris, has undertaken to examine and compare these Egyptian and Arabian specimens with other similar collections, especially with the one made by M. Boué on Mount Sinai, which had been determined by M. Decaisne (vid. *Annales des Sciences Naturelles*). The result of this scrutiny we shall, in due time, communicate to the subscribers, so that if errors should have crept in, during the present hurry of naming them, we trust to be pardoned.

"We have already invited the subscribers to double the amount of their subscription for the Egypto-Arabian expedition, and most of them have responded to the call. Some of them, however, not having yet done so, we consider it requisite for the purpose of distributing the shares to repeat this request, and shall then take it for granted that every one who has not raised his subscription to 60 florins (£6) intends to receive only half of the species collected in Arabia Petræa.

"With respect to the journey of M. Schimper to Yemen, and probably thence to Abyssinia, we intend to communicate the particulars shortly, and in the mean time shall only give the satisfactory statement that M. Schimper, who had set off in October last for Gedda, from Suez, and had made an excursion from the former place during the months of November and December, to Taifa, on the high mountains of the Hedja, was on the 24th of January in Gedda, and in perfect health.

"Highly afflicting, however, is the account of the decease of that zealous Botanist, Dr. Frank, with whose merits the members of our *Unio-Itineraria* had been made acquainted through his collections of dried specimens of plants, gathered in the State of Ohio. What he had again collected for us in the year 1835, has been delivered into our hands by his widow, who was attacked with the yellow fever at New Orleans at the same time with her husband, but having happily recovered, is returned to Germany. These specimens had been gathered with great care, and consist partly of interesting and scarce individuals, as, for instance, *Jeffersonia diphylla* of Persoon, in flower and in fruit; *Loranthus piperoides* of Kunth; *Panax quinquefolia*, Linn.; *Menispermum Cocculus*, Linn.; *Silene Antirrhina*, Linn.; *Collinsia verna*, Nuttall, *Capraria multifida*, Michaux; *Synandra grandiflora*, Nuttall; *Houstonia varians*, Michaux; *Parietaria Pennsylvanica*, Muhlenberg; *Trillium sessile*, Linnæus; *Ligusticum actæifolium*, Linn.; *Flörkea palustris*, Nuttall; *Stylophorum Ohiënse*, Sprengel; *Queria Canadensis*, Linn.; *Aira capillaris*, Lamarck; *Festuca nutans*, Muhlenberg; *Triodia cuprea*, Jacquin; *Zizania clavulosa*, Michaux; *Trichophorum lineatum*, Pursh; and particularly of a great many scarce individuals of the genus *Carex*. From these plants, which are chiefly natives of the State of Ohio, but partly also of the more southern States, three different collections will be formed, viz.—

"No. I. About a hundred species for such subscribers as have already received a centuria from Ohio, excluding as much as possible, such as they have previously had.

"No. II. In like manner, for such individuals as have already received a cen-

turia of Pennsylvanian and Ohio specimens together.

"No. III. About two hundred species for such subscribers as have not hitherto had North American plants from the Unio.

"The amount of subscription for the above is 11 florins, or 22s. sterling, per centuria, or a hundred specimens; and the distribution will take place after that of the Egyptian and Arabian plants has terminated.

"In addition, we have been commissioned by the widow of the late Dr. Frank, to offer his Herbarium to the friends of botanical science. It contains at least from five thousand to six thousand species, consisting of fifteen thousand individual specimens, of which more than four thousand species are German or Swiss; among them are also the scarcest ones from the French Alps, particularly from the South and from the Pyrénées. There are also more than three hundred North American species, gathered by himself, and about one thousand species derived from other parts of the globe, and which have been cultivated in Europe."

STEUDEL & HOCHSTETTER.

DIONÆA MUSCIPULA (the *Carolina Fly-Trap*). This interesting plant, now common in all the gardens of the curious, but long supposed to be confined in its native country to almost a single habitat, is thus mentioned by Mr. M. A. Curtis, in his "Enumeration of the plants growing spontaneously around Wilmington, in North Carolina," "The *Dionæa muscipula* is found as far North as Newbern, North Carolina, and from the mouth of Cape Fear River nearly to Fayetteville. Elliott says, on the authority of General Pinckney, that it grows along the lower branches of the Santee, in South Carolina, and I think it is not improbable that it inhabits the Savannahs more or less abundantly from the latter place to Newbern. It is found in great plenty for many miles around Wilmington, in every direction.

I venture a short notice of this interesting and curious plant, not being aware that any popular description of it has been published in this country. The leaf, which is the only remarkable part, springs from the root, spreading upon the ground, or at a little elevation above it. It is composed of a petiole or stem with broad margins, like the leaf of the orange-tree, two to four inches long, which, at the end, suddenly expands into a thick and somewhat rigid leaf, the two sides of which are semicircular, about two-thirds of an inch across, and fringed around their edges with somewhat rigid ciliæ, or long hairs, like eye-lashes. The leaf, indeed, may be very aptly compared to two upper eye-lids, joined at their bases. Each portion of the leaf is a little concave on the inner side, where are placed three delicate, hair-like organs, in such an order that an insect can hardly traverse it, without interfering with one of them, when the two sides suddenly collapse and inclose the prey, with a force surpassing an insect's attempts to escape. The fringe or hairs of the opposite sides of the leaf interlace, like the fingers of the two hands, clasped together. The sensitiveness resides only in these hair-like processes on the inside, as the leaf may be touched or pressed in any other part, without sensible effects. The little prisoner is not crushed and suddenly destroyed, as is sometimes supposed, for I have often liberated captive flies and spiders, which sped away as fast as fear or joy could hasten them. At other times, I have found them enveloped in a fluid of mucilaginous consistence, which seems to act as a solvent, the insects being more or less consumed in it. This circumstance has suggested the possibility of the insects being made subservient to the nourishment of the plant, through an apparatus of absorbent vessels in the leaves. But as I have not examined sufficiently to pronounce on the universality of this result, it will require further observation and experiment on the spot, to ascertain its nature and importance. It is not to be supposed, however, that such food is necessary to the existence of the plant, though, like compost, it may increase its growth and vigour. But however obscure and uncertain may be the final purpose of such a singular organiza-

tion, if it were a problem to construct a plant with reference to entrapping insects, I cannot conceive of a form and organization better adapted to secure that end, than are found in the *Dioneæ muscipula*. I therefore deem it no credulous inference, that its leaves are constructed for that specific object, whether insects subserve the purpose of nourishment to the plant or not. It is no objection to this view, that they are subject to blind accident, and sometimes close upon straws, as well as insects. It would be a curious vegetable, indeed, that had a faculty of distinguishing bodies, and recoiled at the touch of one, while it quietly submitted to violence from another. Such capricious sensitiveness is not a property of the vegetable kingdom. The spider's net is spread to ensnare flies, yet it catches whatever falls upon it; and the ant-lion is roused from his hiding-place by the fall of a pebble: so much are insects, also, subject to the blindness of accident."

In the "*Index Seminium, quæ Hortus Botanicus Imperialis Petropolitanus pro mutua commutatione offert,*" recently printed by Drs. Fischer and C. A. Meyer, those excellent Botanists have given the characters of several lately-discovered species of plants of New California, a country peculiarly interesting to us, in consequence of the researches of Mr. Douglas and the Naturalists of Captain Beechey's voyage, in that and the neighbouring western shores of North America. As *Indices* of this description are not in general circulation, nor preserved with the care that many of them merit, we are anxious to afford greater publicity to these descriptions, and to give them a place in our Journal.

AMSINCKIA *intermedia:* corolla fauce glabra nuda, limbo tubo subbreviore, staminibus ad faucem insertis. Corollæ tubus 1½ lin. longus, limbus fere 3 lin. in diametro, saturate aurantiacus maculisque 5 saturatioribus pictus. Species intermedia *A. lycopsioidem* inter et *A. spectabilem;* a priore dignoscitur insertione staminum, a posteriore corollis longe minoribus et præsertim corollæ tubo non (ut in illa) ad faucem plicis intrusis semiclausa.—Hab. cum sequente specie circa coloniam Ruthenorum Ross in portu Bodega Nova California.

A. spectabilis; corolla fauce glabra plicis intrusis semiclausa, limbo longitudine tubi, staminibus ad faucem insertis. Species pulchritudine florum insignis atque distinctissima. Corolla aurea, limbo 6 lin. in diametro, ad faucem plicis 5, squamulas simulantibus aucta.

BAERIA. F. et M. Calathidium multiflorum, heterogamum, radiatum. Periclinii squamæ (sub) 10, æquales, planæ, biserialæ. *Flosculi disci hermaphroditi* 5-dentati. *Flosculi radii fœminei* ligulati, fertiles, uniseriati. Achænia omnia conformia, fusiformia, compresso-subtetragona, lævia, glabra, calva, obtusa, areoli terminali parva. Clinanthium conicum, nudum. Genus et *tribu Helianthearum, Cass.,* optime distinctum, *Lustheniæ* proximum, sed in nostro periclinii squamæ liberæ, in illa, pro more *Othonnæ,* conferruminatæ; *Madia* (*Biotia, Cass.*) differt habitu, clinantheo plano, nec non squamis periclinii et clinanthii navicularibus; *Villanova, Leg.* et *Unxia,* L. *fil.* differunt periclinio pentaphyllo, clinanthio plano, flosculis paucis aliisque notis; genus *Coinogyne, Less.,* etiamsi notis aliquot cum nostro convenit, habitu, periclinii squamis inæqualibus, achæniis sulcatis et corollis flosculorum fæmineorum bilabiatis diversissimum.

B. *chrysostoma;* annua gracilis erecta ramosa, pilis simplicibus adspersa, subglabra, ramis elongatis apice nudis, foliis oppositis sessilibus linearibus integerrimis, calathidiis terminalibus solitariis magnitudine et forma illis *Melampodii ovatifolii,* periclinii phyllis late ovatis erecto-patulis, flosculis aureis, radii ligulatis indivisis vel subtridentatis, antherarum tubo aureo, stigmatibus (stylorum ramis) cono superatis, achæniis parvis lævibus nitidulis griseis. Hab. Circa coloniam Ruthenorum Ross, in sinu Bodega Nova California.

Diximus in honorem viri eruditissimi, doctissimi *K. E. de Baer* Academiæ Im-

perialis Scientiarum Petropolitanæ sodalis.

BETCKEA *major;* annua viridis, caulibus alato-tetragonis, staminibus longitudine corollæ. Species bene distincta, habitu et foliorum forma *B. samolifoliæ* similis, sed omnibus partibus major, viridis (non glauca); caulis et rami quadranguli, angulis ala angusta notatis; bracteæ longiores et angustiores; flores illis *B. samolifoliæ* quadruplo majores, dilute rosei; stamina corolla fere longiora; achenia ut in *B. samolifolia,* nisi paulo majora, glabra vel obsolete pubescentia. Simillima *Plectritidi congestæ,* sed fructus forma ab illa facile recognoscenda.—Hab. in Nova California, circa coloniam Ruthenorum Ross.

CALLICHROA. F. et M. Calathidium multiflorum, heterogamum, radiatum. Periclinii squamæ (20 circiter) erectæ, biseriatæ; seriei exterioris achenia flosculorum fæmineorum obtegentes. *Flosculi disci hermaphroditi* 5-dentati. *Flosculi radii* ligulati fertiles, uni-vel subbiseriati. Achænia fusiformia, subcompressa, apice truncata: flosculorum hermaphroditorum pubescentia pappo coronata; fæmineorum glabra, calvæ. Setæ pappi numerosæ, uniseriatæ, serrulato-scabræ, persistentes. Clinanthium planum, pubescens margine squamosum.—Genus insigne e *tribu Helianthearum Cass., Helenio, Blepharopappo, Picradeniæ* et *Lustheniæ* proximum, sed bene distinctum; accedit etiam characteribus nonnullis ad *Doronicum,* at achæniis fusiformibus, non costatis neque sulcatis, habitu et stylorum structura longe diversum.

C. *platyglossa,* annua gracilis ramosa, pilis simplicibus albis elongatis et pubo brevi subcanescens, foliis plerumque alternis linearibus integerrimis vel paucidentatis, flosculis flavis radii 4—5 lin. longis, 3 lin. latis apice bi-trifidis, antheris nigricantibus, achæniis disci fere *Xeranthemi,* pilis apice bifidis sericeis pappo achenio vix breviore coronatis.—Hab. circa Coloniam Ruthenorum Ross, in Nova California.

CLAYTONIA *gypsophiloides;* annua glauca, foliis radicalibus longissimis filiformibus caulinis geminis (sæpissime) uno latere connatis, racemis simplicibus ebracteatis, petalis sublinearibus emarginatis calyce triplo longioribus. — Multicaulis, 6—10 poll. alta; folia radicalia semipedalia vel longiora; flores pulchelli, illis *Gypsophilæ acutifolia* vel *G. perfoliatæ* similes, rosei; capsula subtrisperma, semina atra, nitida, punctis impressis minutis notata.—Hab. in Nova California, circa Coloniam Ruthenorum Ross.

COLLINSIA *sparsiflora;* diffusa, foliis omnibus oppositis, floribus solitariis, pedicello calyce sublongiore, capsula globosa. —Glabriuscula, ramosissima, caulibusque ramisque filiformibus; folia omnia, etiam summa, opposita, qua nota a reliquis speciebus hujus generis distincta; flores solitarii vel rarius oppositi, magnitudine inter *C. grandifloram* et *C. parvifloram* intermedii; corolla dilute violacea, laciniis lateralibus labii inferioris saturate purpurascentibus.—Hab. circa Coloniam Ruthenorum Ross, in Nova California.

ECHINOSPERMUM *leiocarpum;* annuum ramosum diffusum pilis erecto-patulis subincanum, foliis subbilinearibus obtusis, racemis foliosis, calycibus fructiferis clausis, carpellis inermibus lævissimis.—Herba vix semipedalis; flores minuti, albi cum squamulis parvis flavis ad faucem; carpella lævissime, nitida, cinerascentia, non perforata, hinc convexa, illinc plana et sulco longitudinali notata, quocum sulco carpella receptaculo filiformi affixa sunt.—Species ob calyces fructiferos clausos et ob carpella lævissima in genere quadammodo anomala, reliquis characteribus autem totoque habitu cum *Echinospermis* haud male congruit.—Hab. circa Coloniam Ruthenorum Ross in Nova California.

EUCHARIDIUM. F. et M. Calycis tubus supra ovarium elongatus filiformis cum limbo 4-partito deciduus. Petala 4, unguiculata (trifida). Stamina 4! Stigma bilobum. Capsula 4-locularis, 4-valvis, dehiscens. Semina numerosa, in quovis loculo uniserialis, sursum imbricata, erecta, alato-marginata. Genus insigne *Clarkiæ* proximum.

E. *concinuum;* annuum, habitu *Clarkiæ elegantis,* folia ovata vel ovato-oblonga,

integerrima petiolata sparsa infima opposita; calyx rufescenti-purpureus, laciniis apice sæpe coherentibus; petala 7—8 lin. longa, saturata rosea, maculis 2 saturatioribus, lineisque 3 albidis picta; antheræ basi affixæ; pollinis granula obtuse angulata, discreta, filis vix ullis; semina subovata, ala angusta tenui connivente cincta. —Hab. in Nova California, circa Coloniam Ruthenorum Ross.

EUPHORBIA *dictyosperma;* exstipulata annua glaberrima, caule erectiusculo, verticillo triradiato, radiis elongatis dichotomis; foliis serrulatis obtusis, caulinis inferioribus spathulato-obovatis, superioribus obovato-subcordatis, rameis subcordato-ovatis; calathidii appendicibus rotundatis; capsulæ coccis distinctis verrucosis; seminibus subovatis reticulato-venosis.—Accedit hæc species habitu ad *E. Peplum* et *E. Helioscopiam,* ab utraque vero notis indicatis diversa. Folia fere *E. Helioscopiæ;* calathidia parva appendicibus parvulis, viridi-lutescentibus; capsula depressa altitudine suæ latior, coccis rotundatis dorso verrucosis; semina ovato-subglobosa, fuscescentia, nitidula, venis prominulis tenuissimis reticulata.—Hab. in portu Bodega Novæ Californiæ.

EUTOCA *Wrangeliana;* diffusa, pubescens; foliis ovatis acutis integerrimis; corollis calyce subduplo longioribus, stamina æquantibus; placentis 8—10 ovulatis.—Species in genere facile pulcherrima et satis, ut nobis videtur, distincta, ad *E. divaricatam,* Benth., proxime accedit, sed caulis in nostra planta haud dichotomus, corollæ calyce fere duplo longior et ovula in quavis placenta pauciora. Herba canescens, ramosissima, diffusa; folia plerumque integerrima, rarius dente uno alterove instructa; calyx vix $\frac{2}{3}$ partes corollæ æquans, sæpe corolla subduplo brevior; corolla ampla, diametro pollicari, cærules centiviolascens, tenerrima, subhyalina, lobis suborbiculatis denticulatis.—Hab. circa Coloniam Ross, in Nova California.

LOTUS *Wrangelianus,* annuus, diffusus, pilosus, subglaber; foliis 4-foliolatis, foliolis oblongis subglaucis; pedunculis axillaribus brevissimis unifloris ebracteatis; leguminibus subpubescentibus.—L. *subpimento* proximus, at pube rariore incumbente adspersus et legumina pubescentia: a L. (*Hosackea*) *parvifloro* dignoscitur pedunculis ebracteatis aliisque notis.—Herba annua, tenuissima, habitu L. *subpinnati;* flores parvi flavi; legumina semipollicaria teretiuscula, seminibus 5—7 subtetragonis lævibus griseis fœta.—Hab. in portu Bodega Nova California, prope Coloniam Ruthenoram Ross.

OBS. Folia in omnibus *Loti* speciebus non ternata sed certe pinnata sunt; foliola enim infima (ab auctoribus male cum stipulis commutata), cum petiolo articulata, pro stipulis haberi non possunt. Cæterum stipulæ veræ, licet plerumque minutæ et cito marcescentes, in ima petiolorum basi semper adsunt.

MICROPUS *Californicus;* squamis fructiferis compresso-naviculàribus lævibus antice rectilineis.—Planta annua *M. erecto* prorsus similis; calathidia lanugine rariore brevioreque vestita; squamæ fructiferæ (i. e. achænia includentes) forma fere squamarum periclinii *Sclerocarpi Africani,* naviculares, compressæ, dorso gibbæ, antice rectilineæ et apiculo mucroniformi recto terminatæ (in *M. erecto* squamæ, quoad formam, Cassidi *Aconiti Napelli* sat similes sunt).—Hab. circa Coloniam Ruthenorum in portu Bodega Nova California.

MYOSOTIS *Californica;* annua, strigosa, ramosissima, procumbens; foliis linearibus acutis ciliatis; racemis elongatis basi foliosis; pedicellis brevissimis; calycibus corolla sublongioribus, fructiferis patentibus; carpellis rugosis.—Caules setulis adpressis scabri; folia pilis patentibus ciliata; calyces setis simplicibus rectis patentissimis hispidi; corollæ calyce subbrevior, alba cum glandulis 10 flavis ad faucem, laciniis limbi rotundatis haud emarginatis.—*M. Chorisianæ, Cham.* proxima, sed floribus subsessilibus diversa.—Hab. in Nova California circa Coloniam Ross.

PLATYSTEMON *leiocarpum;* ovariis fructibusque glaberrimis.—A simillimo *P. Californico, Benth.* differt ovariis glaberrimis, nullo modo hispidis, nec non floribus

ochroleucis.—Hab. circa Coloniam Ruthenorum Ross in Nova California.

Platystigma *lineare*. Nostra planta, e seminibus enata circa coloniam Ross in Nova California lectis, filamenta habet dilatata, lineari-oblonga, et petala bicolora, exteriora tria aurea cum litura transversali alba, interiora tria alba, ungue flavo,—ceterum cum descriptione *P. linearis* a Benthamio data haud male congruit.

Plectritis *brachystemon;* staminibus longitudine corollæ.—Omnibus partibus *P. congestæ* similis, præter flores quadruplo minores albos et stamina non exserta.—Hab. in portu Bodega Novæ Californiæ.

Pterostegia, F. et M. Flores hermaphroditi (interdum polygami?) involucro diphyllo, fructifero ampliato dorsoque cristato obtecti. Calyx 6- (interdum 5) partitus, herbaceus, persistens. Corolla nulla. Stamina 6 (vel 5). Styli 3, brevissimi. Stigmata capitata. Caryopsis triquetra. Semen albuminosum. Embryo axilis, inversus; radicula supera.

P. *drymarioides*. Planta annua e *Polygonacearum* familia, habitu *Drymariæ* simillima, ramosissima, prostrata, pilis minutis simplicibus adspersa, subglabra; rami elongati, filiformes subdichotomi; folia omnia opposita! obovato-spathulata, subreniformia vel suborbiculata, in petiolum attenuata, integerrima v. apice emarginata; ochreæ nullæ! flores axillares, subsessiles, minuti; involucri phylla duo, initio parva, fructifera ampliata, membranacea, reticulato-venosa, inæquilatera dorsoque cristato-alata, caryopsin arcte includentia; caryopsis calyce major, acuta, lævis, structura ut in *Königia*.—Hab. in portu Bodega Nova California.

Sphærostigma, *Seringe*. Calycis tubus supra ovarium vix productus; limbus 4-partitus, deciduus. Petala 4 sessilia (indivisa). Stamina 8. Stigma globosum indivisum. Capsula 4-locularis, 4-valvis dehiscens. Semina numerosa, in quovis loculo uniserialia, erecta, aptera, nuda.—Herbæ annuæ, habitu *Epilobii*, glabræ vel pube simplici obtectæ, ramosæ, diffusæ; rami apicibus sæpe recurvati; folia sparsa (infima sæpe opposita), sessilia vel in petiolum attenuata, indivisa; flores axillares solitarii, sessiles, parvi, flavi; stamina alterna breviora; antheræ subglobosæ, basi affixæ; pollinia obtuse angulata, filis brevibus intermixta; capsulæ sessiles elongatæ, sæpe curvatæ vel tortæ, semina minuta, oblonga, non angulata.

S. *strigulosum;* setulis minutis incumbentibus adspersum subglabrum; foliis sublinearibus utrinque attenuatis dentatis; petalis ovato-orbiculatis; capsula elongata filiformi recta vel incurva.—Præcedenti (*S. Chamissonis*) simillimum, at diversum indumenti indole, nec non floribus et seminibus minoribus.—Petala linea vix longiora; stylus petalis brevior; capsula pergracilis, semina minuta, vix $\frac{1}{2}$ lin. longa.—Hab. in Nova California.

Quatuor species Thysanocarpi generis, quæ nunc sub oculis sunt, sequenti modo definiri possunt.

T. *curvipes* (*Hook. Fl. Bor. Am. v.* 1. *p.* 69. *tab. XVIII. fig. A.*)*;* petalis calyce brevioribus; siliculis glaberrimis ala integra (vel foraminibus exiguis pertusa) cinctis apice emarginatis styloque vix exserto terminatis.

T. *pulchellus;* petalis calyce longioribus; siliculis glaberrimis ala integra (non pertusa) cinctis apice subtruncatis styloque longe exserto terminatis.—Antecedenti speciei simillima, notis indicatis tamen satis distincta. Petala albida vel violascentia, parvula, calyce tamen firme longiora. —Hab. circa coloniam Ruthenorum Ross.

T. *elegans*, F. et M.; petalis calyce longioribus; siliculis glaberrimis ala foraminosa cinctis apice truncatis styloque exserto terminalis.—A. *T. pulchello*, quocum crescit et cui ceterum persimilis est, silicularum ala foraminibus numerosis latis uniseriatis pertusa facile dignoscitur.

Quarta species hujus generis, a celeb. Deppe in California detecta, a nostro *T. elegante* differt siliculis villosis apice emarginatis styloque vix exserto terminatis.

Trichophyllum *lanatum* (*Nutt.*—*Eriophyllum cæspitosum, Dougl. Lindl. in Bot. Reg. tab.* 1167.) Periclinium certe non monophyllum, e phyllis 12 circiter arcte conniventibus lanaque involutis com-

positum; ergo genus *Phialis* (*Spr. Genera Plant. p.* 631.), ut pote supervacaneum, delendum est.

TRIPHYSARIA, F. et M. Calyx tubulosus, 4-fidus. Corolla personata: tubo filiformi; labio superiore indiviso subulato, inferiore tripartito, laciniis saccatis! Stamina didynama, omnia fertilia. Antheræ lineares, muticæ, 1-loculares! Stylus simplex. Stigma oblongum, bilobum. Capsula oblonga, polysperma, bilocularis, bivalvis; valvulis margine liberis; dissepimento parietali placentæ centrali adnato. Semina oblonga, aptera: testa scrobiculata nucleo arcte adherente.

T. *versicolor*. *Rhinanthacea* annua, habitu *Oncorhynchi;* folia elongata, ima basi dilatata semiamplexicaulia, apice pinnati-lobata incisa, sparsa, infima sæpe opposita, floralia calyce vix longiora; flores axillares, solitarii, sessiles; corolla alba, dein rosea, tubus filiformis calyce duplo longior, labium superius rectum subulatum, marginibus inflexis, inferius amplum e vesiculis compositum tribus obovatis, lacinula parva erecta apiculatis et in fauce rima longitudinali instructis; capsula calyce inclusa; semina numerosa, parva, nigricantia.—Hab. in Novæ Californiæ portu Bodega.

Dr. Grisebach, of Berlin, is zealously studying the *Gentianeæ*, with the view to publishing a monograph of that Order. In an inaugural Dissertation now before us, which that gentleman has recently published at Berlin, entitled "*Observationes quædam de Gentianearum familiæ characteribus*," he has treated the subject in a masterly manner. Under the *first* head he has given the essential characters of the family. Under the second, entitled "*Morphological Observations*," he has treated on the Organs of Nutrution (*organa vegetativa*), and the Organs of Reproduction. Under the third head, on the natural affinities of the family. Under the fourth, of the genera to be excluded from the family:[1] while under the last head he gives a "Clavis Generum Artificialis." The following is his arrangement with the characters of the genera:—

A. *Æstivatio corollæ dextrorsum contorta. Albumen cavum seminis explens.*

I. Placentæ cum endocarpio connatæ, indeque semina ex ipsa valvularum superficie oriunda.—Antheræ immutatæ.

1. *Gentiana*, L. Filamenta basi æqualia. Stigmata terminalia ovario vel stylo imposita. Foveæ epipetalæ glanduliferæ 0.—Glandulæ epipetalæ tantum in una generis sectione.

2. *Ophelia*, Don. Filamenta basi dilatata submonadelpha. Stigmata terminalia ovario imposita. Glandulæ epipetalæ, nec squamula tectæ, nec fimbriis cinctæ.—Corolla rotata absque corona.

3. *Pleurogyne*, Eschh. ap. Cham. (*Lomatogonium* a Br.). Stigmata suturis carpellorum imposita.—Filamenta basi æqualia. Corolla rotata, corona aucta, eglandulosa.

4. *Swertià*, L. Stigma ovario impositum, reniforme. Foveæ epipetalæ, glanduliferæ, fimbriis cinctæ. Foliorum radicalium vaginæ alternæ. Corolla rotata absque corona. Filamenta basi æqualia.—Species generis legitimæ, a me examinatæ, sunt; Sw. perennis, L., speciosa, Wall., cuneata, Wall., pluribus mihi nondum obviis. Pleræque auctorum species excludendæ.

5. *Anagallidium*, M. Stigmata stylo ab ovario distincto imposita. Foveæ epipetalæ, glanduliferæ squamula haud fimbriata tectæ.—Folia omnia opposita. Corolla rotata, corona tenuissima fimbriata aucta. Filamenta basi æqualia.—Huc Swertia dichotomæ, L., forte Sw. tetrapetala, Pall.

II. Placentæ 2, 4 suturales, hinc demum liberæ (nunquam placenta demum unica, centralis, libera). Capsula vel 1-locularis vel valvulis introflexis bilocularis vel semi 2—4-locularis.—Corolla absque corona.

(*a.*) Glandulæ epipetalæ.—Corolla rotata. Antheræ immutatæ.

6. *Agathotes*, Don. Foveæ epipetalæ,

[1] These are, 1. *Houstonia*, L. 2. *Mitreola*, Br. 3. *Mitrasacme*, Lab. 4. *Gelseminium*, Juss. 5. *Obolaria*, L. 6. *Anabata*, Willd. 7. *Rochefortia*, Sw. 8. *Sarotha*.

glanduliferæ, squamula fimbriata tectæ. Corolla marcescens. Semina indefinita, minuta.—Filamenta basi æqualia. Stigmata ovario imposita. Capsula sub conica, 1-locularis, placentis suturalibus spongiosis.

7. *Frasera*, Walt. Foveæ epipetalæ, glanduliferæ, margine fimbriatæ. Corolla decidua. Semina subdefinita, magna, alata.—Capsula compressa 1-locularis. Folia verticillata.

8. *Halenia*, Borkh. Petala calcarata, glandulis fundo calcaris impositis.—Capsula 1-locularis.

(*b.*) Glandulæ hypogynæ. — Corolla clavata vel infundibuliformis. Antheræ immutatæ.

9. *Crawfurdia*, Wall. Glandulæ hypogynæ 5. Stigmata oblonga, revoluta, ovario imposita. Corolla clavata, plica aucta. Capsula 1-locularis. Caulis volubilis.

10. *Tachia*, Aubl. Discus glandulosus continuus. Stigmata 2-lamellata, stylo imposita. Corolla infundibuliformis, absque plica. Capsula valvulis introflexis intus discretis, semi-4-locularis. Caulis in una specie volubilis.

(*c.*) Apparatus glandulosus in fundo corollæ 0.

(*a. a.*) Stigma indivisum! stylo ab ovario distincto impositum.

11. *Chironia*, L. Corolla rotata, circa capsulam marcescens (lobis hinc deciduis). Capsula valvulis introflexis semibilocularis, rario 1-locularis. Antherarum rima involuta.—Africanæ. Huc pertinet Exacum viscosum Ait.—A generis indole paullum discrepant Chironia frutescens L., antheris spiralibus et disco glanduloso intracalycino; Chironia Krebsii M. antheris spiralibus et stigmate clavato (habitus fere Sabbatiæ Australis Schtdl. Cham.).

12. *Exacum*, L. Corolla rotata, circa capsulam marcescens. Capsula valvulis introflexis complete bilocularis, placentis demum utrinque liberis. Antheræ immutatæ, poro dehiscentes.—Asiaticæ.

13. *Voyra*, Aubl. Corolla infundibuliformis, tubo elongato basi tumido, demum scisso. Capsula valvulis introflexis semibilocularis. Antheræ immutatæ, rima dehiscentes.—Testa utrinque longe apiculata, arillum mentiens.—Parasiticæ Americanæ.—Sectio Leiphaimos, ad quam pertinent V. uniflora, Lam., tenella, Guild. et Mexicana M. (Leiphaimos parasitica Schtdl. Cham.), differt a legitimis, quarum calyx squamulis 3 calyculiformibus cingitur: calyce nudo, capsula demum annulari, scilicet medio dehiscente, apicibus valvularum unitis.

14. *Cicendia*, Adans. Corolla infundibuliformis, demum supra capsulam torta, tubo brevi. Capsula 1-locularis, hinc semibilocularis. Antheræ immutatæ.—Generis sectiones 3, prima capsula 1-loculari, inflorescentia terminali, flore tetramero (Cicendia filiformis, Rchb.); altera capsula semibiloculari, inflorescentia terminali, flore tetramero (Hippocentaurea, Rchb.); tertia capsula 1-loculari glomerulis axillaribus, flore pentamero (Hippion, Sprgl.; Slevogtia, Rchb.).

(*b. b.*) Stigma indivisum (subbifidum) ovario! impositum.

15. *Centaurella*, Mich. Corolla infundibuliformis, circa capsulam marcescens, tubo brevi. Capsula 1-locularis. Antheræ immutatæ.—Ovarium hinc apice attenuatum, neque vero stylus distinctus.—Americæ Borealis incolæ.

(*c. c.*) Stigmata 2 bilamellata vel bicruria, stylo imposita.

(*α.*) Corolla (infundibuliformis) demum supra capsulam torta.

16. *Erythræa*, Pers. Antheræ demum spirales. Capsula 1-locularis vel sepius bilocularis.—Species Chilensis capsula 1-loculari recedit; Indica stigmata indiviso; hæ et formæ quædam Europææ stigmatibus contiguis, distinguuntur a Gen. 12—14 antheris spiralibus, a Chironia antherarum rima non involuta, corolla infundibuliformi demum torta, tubo demum papyraceo ruptili.

17. *Canscora*, Lam. Antheræ immutatæ. Corolla bilabiata, labio superiori profunde bilobo, lobis basi 3-andris (filamentis hinc abortivis), labio inferiori emarginato monandro (stamine ceteris longiori). Cap-

sula 1-locularis, placentis spongiosis.—Stigmata hinc biglobosa.—Corolla nonnunquam decidua, itaque flore irregulari a sequente sectione distinguenda.

18. *Orthostemon*, Br. Antheræ immutatæ. Corolla regularis. Capsula 1-locularis. Stigmata subrotunda. Genus, nondum a me visum, propter ignotam corollæ marcescentiæ indolem dubium, magis ex affinitate huc relatum.

(*β*.) Corolla demum circa capsulam marcescens rarissime deciduæ.

19. *Sabbatia*, Adans. Antheræ demum revolutæ (vel spirales). Corolla rotata, 5—12 mera. Stigmata 2 cruria, cruribus demum spiralibus. Capsula 1-locularis, valvulis paullum intus productis.

20. *Chlora*, L. Antheræ immutatæ. Corolla rotata, 8, 6 mera. Stigmata bilamellata, stylo hinc bifido. Capsulo 1-locularis, placentis spongiosis.

21. *Dejanira*, Schtdl. Cham. (Callopisma Mart.). Antheræ immutatæ, poro dehiscentes! Corolla subrotata. Stigmata bicruria. Capsula valvulis introflexis intus discretis semi 4-locularis.

22. *Schultesia*, Mart. Antheræ immutatæ. Corolla infundibuliformis, 4 mera. Stigmata 2 lamellata. Capsula semibilocularis. Calyx sæpe alatus.

23. *Lisianthus*, P. Br. Antheræ incumbentes, plerumque demum recurvæ. Corolla infundibuliformis, marcescens, 5 mera. Stigmata bilamellata. Capsula valvulis introflexis semi 4—2-locularis, vel sæpius complete bilocularis, placentis utrinque binis.

24. *Irlbachia*, Mart. Antheræ erectæ, demum recurvæ. Corolla infundibuliformis, decidua, 5 mera. Stigmata bicruria. Capsula valvulis introflexis 2-locularis, placentis utrinque binis. Corolla in utraque facie penicillato glandulosa: tamen a Gen. 6—8 corollæ forma facilis distincta. Ceterum ob Lisianthum cærulescentum, Aubl. intermedium dubito, an genus a Lisianthis jure separetur.

25. *Helia*, Mart. Antheræ erectæ, immutatæ. Corolla hypocrateriformis, marcescens, 5 mera, tubo gibbo. Stigmata 2 cruria. Capsula valvulis introflexis bilocularis, placenta utrinque unica.—Ex habitu Polemoniaceis quibusdam accedit.

26. *Coutoubea*, Aubl. Filamenta utrinque 2 dentata. Calyx bracteis calyculiformibus suffultus. Antheræ immutatæ. Corolla hypocrateriformis, 4 mera. Stigmata 2 lamellata. Capsula semi-2-locularis, demum semi-4-locularis.

27. *Prepusa*, Mart. Calycis suturæ alatæ. Antheræ immutatæ. Corolla campanulata 6 mera. Stigmata 2 lamellata. Capsula 1 locularis, valvulis vix introflexis.

III. Placenta unica centralis (demum) libera.

28. *Exadenus*, M. Stigmata 2 oblonga, ovario imposita. Corolla rotata, 4 mera, lobis extus glandula instructis. Antheræ immutatæ. Capsula valvulis introflexis placentum prehendentibus bilocularis.—Huc Swertia parviflora H. B. K. et brevicornis H. B. K.

29. *Sebæa*, R. Br. Stigmata 2 cruria (vel stigma 1 bilobum) stylo imposita. Antheræ demum recurvæ.—Corolla hypocrateriformis vel infundibuliformis. Placenta centralis a valvulis (demum ?) libera.

30. *Schuebleria*, Mart. Stigma indivisum stylo impositum. Antheræ immutatæ.—Corolla infundibuliformis. Capsula valvulis introflexis placentam prehendentibus bilocularis.

B. *Æstivatio corollæ induplicativa. Albumen cavo seminis minus. Capsula* 1 *locularis. Antheræ immutatæ. Corolla apparatu glanduloso, sæpius appendicibus quoque instructa.*

31. *Menyanthes*, L. Placentæ cum endocarpio connatæ (semina in nervo valvulæ medio 1 serialia). Capsula juxta suturam valvularum ruptilis.—Petala carnosa.

32. *Villarsia*, Vent. Placentæ suturales. Capsula 2-valvis, valvis 2-fidis.—Petala carnosa.—Huc quoque Menyanthes crista galli, Menz.

33. *Limnanthemum*, Gmel. Placentæ suturales. Capsula evalvis, demum maceratione aperta.—Petala fugitiva.

SYNOPSIS OF THE HEMIMERIDEÆ, A TRIBE OF SCROPHULARIACEÆ.

By George Bentham, Esq., F.L.S.

THE genus *Hemimeris* was first established by Thunberg (Nov. Pl. Gen. Pars. 4.) for five Cape plants, characterized chiefly by a rotate corolla, with the "fossula laciniarum nectarifera." It was taken up by Linnæus, on Thunberg's authority, but for a long time the plants themselves appear to have been lost sight of, especially by continental Botanists, and the above-mentioned character misunderstood. Willdenow considered as additional species of *Hemimeris*, two Peruvian plants, heretofore placed in *Celsia* (now in *Alonsoa*, R. et P.), and which have no concavities at the base of the corolla, nor any thing to which the words "fossula nectarifera" could be applied, although he still retained them in the generic character. His example was followed by Persoon, Kunth, and others, some of whom inserted, and others silently omitted the "fossula laciniarum nectarifera," which they could not find in the Peruvian plants. Link and Otto on the other hand, having at length one of the Cape species under cultivation, were struck by these remarkable concavities, and not perceiving that they were the original foundation of Thunberg's character, established a new genus under the name of *Diascia*. This was taken up by Sprengel, who transferred to it all Thunberg's *Hemimerides*, and left to the latter genus neither the character nor any of the species originally contemplated by its author.

In restoring the name of *Hemimeris* to these original species, it has appeared to me, however, adviseable to separate the didynamous from the diandrous ones, as the difference in the stamina is accompanied by a decided diversity in the form of the corolla; and as the name of *Diascia* happens to have been given to a didynamous species, and is more particularly applicable to the form of the corolla in that group, I have so applied it, retaining the diandrous ones alone in *Hemimeris*, that is to say, the *H. montana* and *sabulosa* of Thunberg, with one new species.

In *Diascia* the concavities of the corolla are often each of them elongated into a spur, which is sometimes remarkably long; but this is a character so little accompanied by any difference in habit, that it is impossible to make use of it to subdivide the genus. The inflorescence, however, serves to establish two groups so natural that one would be tempted to consider them as genera, could any corresponding difference be traced in the floral organs, which is not the case, as far as I can perceive, but nothing is more difficult than to ascertain the form of the corolla in this set of plants from dried specimens.

I propose referring to *Diascia* the *Hemimeris diffusa*, *macrophylla*, and probably *H. unilabiata* of Thunberg, although I have not seen any specimens corresponding exactly with his description of the latter species. The D. *elongata* comes nearest to it, but the corolla cannot be said to be "bicornis," nor are the sepals obtuse, and in the description of both *H. macrophylla* and *unilabiata* there is the expression "Capsula calyce persistente coronata," which I cannot understand, and if correct, would exclude them altogether from the order of Scrophulariaceæ. To *Diascia* I should also, with Sprengel, refer the *Antirrhinum longicorne*, Thunb., easily recognized by its corolla and long capsule (erroneously described as unilocular and one-valved), and I have now added thirteen new species.

The close affinity between Thunberg's *Hemimeris* and the Cape *Antirrhina*, now forming the genus *Nemesia*, had already struck that author when he placed them next to each other, and although subsequent Botanists, having chiefly the *Alonsoæ* in view, have almost all removed *Hemimeris* to the neighbourhood of *Celsia*, yet it appears to me more natural to return to the old arrangement, and I have accordingly placed *Nemesia* in the present group. The structure of the sexual organs is the same as in *Diascia*, but the two concavities of the corolla are confluent into one pouch

or spur, sometimes retuse or slightly emarginate at the extremity, and the capsule is remarkably compressed and truncate or emarginate at the top.

The genus was first proposed by Ventenat, (Jard. Malm. t. 41.), for a species which I do not recognize in any of the specimens before me, unless it be a cultivated variety of *N. linearis* of the same author. The latter species is probably the *Antirrhinum capense,* Thunb. Ventenat's third species, *N. chamædrifolia,* or *Antirrhinum macrocarpum,* Ait., is evidently the same also as *Ant. scabrum,* Thunb. Persoon added to the genus the *Ant. bicorne,* Linn., and I now refer to it *Ant. barbatum,* Linn., (*Ant. pinnatum,* Linn.), and eighteen new species. *Ant. fruticans,* Thunb., must also be a *Nemesia,* but not any species that I have seen. Of the remaining Cape *Antirrhina* of authors, the *A. aphyllum,* Linn., is evidently an *Utricularia; A. patens,* Thunb., "floribus terminalibus solitariis," is very doubtful, most probably not a *Nemesia.* So also the *A. dentatum,* Poir., with alternate leaves, and coming from a country far removed from the range of *Nemesia,* as at present known.

Two low creeping plants, the one from the eastern districts of the Cape Colony, the other from Madagascar, with the habit of the section *Cymbalaria* of *Linaria,* the corolla nearly that of *Nemesia* or *Linaria,* but with a capsule different from either, have induced me to propose under the name of *Diclis,* a new genus intermediate between the two last-named. The capsule, however, being two-valved (whence the name), indicates a greater affinity to *Nemesia,* and places it in the tribe of *Hemimerideæ.*

Having thus traced the connecting chain between *Hemimeris* and the *Antirrhineæ,* through *Diascia, Nemesia,* and *Diclis,* we may in the same manner connect it with *Alonsoa* and other rotate *Verbasceæ,* through another South American genus, which has the remarkable concavities of the corolla above referred to, besides a habit in some instances very nearly that of the racemose *Diasciæ.* This is the *Angelonia,* Humb. et Bonpl. Pl. Æquin. 2. 92, which agrees with the old character of *Hemimeris,* although it be, in fact, distinguished as well by some differences in the form of the corolla, as by the capsule, which is loculicidal with entire valves, instead of being septicidal with bifid valves. The genus now contains four already described species and one new one, besides the *A. campestris,* which has been considered by Nees von Esenbeck as a separate genus under the name of *Thylacantha,* on account of its indehiscent fruit. The materials before me are not sufficient to enable me to form myself any opinion on the validity of this division.

The whole of the above genera may be considered as forming a small tribe, allied to *Antirrhineæ* on the one hand, and to *Verbasceæ* on the other. They are distinguished from the former by the valvular dehiscence of the capsule, and in many cases by the double spur, pouch, or protuberance, which is in *Antirrhineæ* always simple, and from *Verbasceæ* and all other *Scrophulariaceæ* by the presence of the spur, pouch, or protuberance, whether simple or double.[1]

I now proceed to give the characters of the genera and species, beginning with that of the whole tribe.

Hemimerideæ.

Calyx 5-fidus vel 5-sepalus. *Corolla* tubo brevissimo, limbo explanato subrotato bilabiato vel personato, late 4—5-lobo basi 1—2-calcarato vel saccato vel bifossulato. *Stylus* simplex, stigmate parvo subcapitato. *Capsula* bivalvis, valvulis integris bifidis vel bipartitis.

Conspectus of the Genera.

1. Thylacantha. Corolla basi saccata. Capsula indehiscens.

2. Angelonia. Corolla basi saccata. Capsula loculicide bivalvis.

3. Hemimeris. Corolla basi bifossu-

[1] *Collinsia* and some *Digitaleæ* have sometimes a slight protuberance on the upper side of the tube, but very different from those of *Hemimerideæ,* which are always at the base of the limb.

lata. Stamina 2. Capsula subglobosa septicide bivalvis.

4. DIASCIA. Corolla basi bifossulata vel bicalcarata. Stamina 4. Capsula subglobosa vel oblonga, septicide bivalvis.

5. NEMESIA. Corolla basi saccata vel 1-calcarata. Capsula compressa septicide bivalvis.

6. DICLIS. Corolla basi 1-calcarata. Capsula subglobosa loculicide bivalvis.

I. THYLACANTHA. *Nees et Mart.*

Calyx 5-partitus. "*Corollæ* labium superius brevissime bifidum, inferius trifidum, basi deorsum ampliatum in ventrem seu saccum obliquum patentem mediaque circumscriptione emarginatum, cui labium inferius trifidum incumbit." (*Nees et Mart.*) *Stamina* 4, didynama. *Antheræ* biloculares, loculis distinctis divaricatis. *Capsula* globosa, evalvis, subresinosa.

1. T. *campestris* (Nees et Mart. Nov. Act. Acad. Nat. Cur. 11. 43.).—Herba erecta, caule tetragono subpiloso. Folia opposita, ovato-oblonga, apice serrata. Flores axillares, solitarii, pedunculati.

HAB. Brazil, *Martius.* (*v. s.*)

II. ANGELONIA, *Humb. et Bonpl.*

Physidium, *Schrad. in Gott. Gel. Anz.* 1821. *p.* 714.

Schelveria, *Nees et Mart. Bot. Zeit.* 1821. 1. 299. *et* 328.

Calyx 5-fidus vel 5-partitus. *Corolla* et *Stamina* Thylacanthæ. *Capsula* globosa, bivalvis, valvulis integris medio septiferis. *Semina* membrana laxa inclusa. Herbæ *Austro-Americanæ, erectæ vel procumbentes.* Folia *opposita vel superiora alterna.* Pedunculi *uniflori, solitarii, axillares vel racemosi.*

1. *A. pubescens*, procumbens, molliter pubescens, caule tereti, foliis petiolatis ovatis acutis remote dentatis cujusque paris subæqualibus, floribus axillaribus.

HAB. Tropical Brazil, *Swainson.* (*v. s.*)

Leaves about an inch long, scarcely opposite. Pedicels short and slender. Flowers larger than in *A. procumbens*, smaller than in the other species.

2. *A. procumbens* (Nees et Mart. Nov. Act. Acad. Nat. Cur. 11. 44.) procumbens, subglabra, caule angulato, foliis subsessilibus ovali-oblongis acutis serratis cujusque paris valde inæqualibus, floribus axillaribus.

Physidium procumbens, *Schrad. l. c.*

Schelveria arguta, *Nees et Mart. Bot. Zeit. l. c.*

HAB. Brazil, *Martius.* (*v. s.*)

Larger leaves of each pair about half to three quarters of an inch long, the opposite ones not half the size. Peduncles very short. Calyx with a few long stiff hairs.

3. *A. salicariæfolia* (Humb. et Bonpl. Pl. Æquin. 2. 92. t. 108.) erecta, pubescens, foliis lanceolatis subserratis floralibus infimis subconformibus plerisque ovato-lanceolatis dentatis pedunculos subæquantibus, floribus racemosis.

HAB. Caraccas, *Humboldt and Bonpland;* Trinidad, *Herb. Hooker.* (*v. s.*)

4. *A. hirta* (Cham. in Linnæa 8. 27.) erecta, pilis sparsis hirta, foliis lanceolatis serratis floralibus plerisque late cordatis abrupte acuminatis subintegerrimis pedicello brevioribus, floribus racemosis.

HAB. Brazil *Sello*, near Bahia, *Salzmann.* (*v. s.*)

5. *A. integerrima* (Spreng. Syst. Cur. Post. 235.) erecta, glaberrima, foliis oblongo-lanceolatis integerrimis, floribus racemosis.

HAB. South Brazil, *Sello;* Rio Grande, *Tweedie.* (*v. s.*)

III. HEMIMERIS. *Thunb.*

Calyx 5-sepalus, æstivatione imbricata. *Corollæ* limbus explanatus subbilabiatus quadrifidus lacinia suprema brevissime emarginata infimaque maximis, lateralibus brevissimis latis; fossulæ 2 flavescentes glandulosæ (?) ad basin labii superioris; appendices 2, dentiformes, genitalia cingentes, ad latera faucis. *Stamina* 2, antheris unilocularibus. *Capsula* subglobosa, bivalvis, calycem æquans. Semina nuda. Herbæ *Austro-Africanæ annuæ, diffusæ vel ramosissimæ.* Folia *opposita vel floralia subfasciculata.* Pedunculi *axillares uniflori, superiores more Vandelliarum subfasciculati, post anthesin reflexi.* Corollæ *flavæ.*

1. *H. sessilifolia*, pubescens, foliis ovato-oblongis sessilibus vel infimis petiolatis obscure dentatis, pedicellis subfasciculatis, laciniis calycinis tribus ovato-oblongis duabus cordato-ovatis obtusis.

HAB. Zwarteland and Paardeberg in Stellenbosch, *Ecklon*. (*v. s.*)

2. *H. montana* (Linn. — Thunb. Fl. Cap. 484.), pubescens rarius glabrata, foliis petiolatis ovatis dentatis, pedicellatis superioribus fasciculatis, laciniis calycinis oblongis vel anguste ovatis capsula vix brevioribus.

Hemimeris alsinoides, *Lam. Dict.* 3. 105.

Diascia montana, *Spreng. Syst.* 2. 800.

HAB. Districts of Cape, Stellenbosch, Worcester, and Clanwilliam, *Ecklon, Drège*, and other collections. (*v. s.*)

A low annual, with something the habit of *Holosteum umbellatum*, and still more that of the smaller East Indian *Vandelliæ*, but very variable in the degree of hairiness as well as in the size of the flowers.

3. *H. sabulosa* (Linn. — Thunb. Fl. Cap. 485.) glabriuscula, foliis petiolatis oblongis inciso-dentatis pinnatifidisve, pedicellis superioribus subfasciculatis, laciniis calycinis lanceolatis oblongisve capsula subduplo brevioribus.

HAB. Districts of the Cape, Caledon, and Clanwilliam, *Ecklon, Drège*, and other collections. (*v. s.*)

Near *H. montana*, but certainly distinct.

IV. DIASCIA. *Link et Otto.*

Calyx 5-sepalus, æstivatione imbricata. *Corolla* basi fossulis, saccis, vel calcaribus 2 aucta, limbo explanato vel concavo subbilabiato, labio superiore bifido inferiore trifido lacinia intermedia sæpius emarginata, omnibus latis rotundatis; appendices in fauce nullæ. *Stamina* 4, didynama; filamenta inferiorum basi circumflexa superiora cingentia, sæpe dilatata vel appendiculata; antheræ uniloculares sæpissime cohærentes. *Capsula* subglobosa, ovoidea vel oblonga, non compressa, apice obtusa. *Semina* nuda.—Herbæ *annuæ vel perennes*. Folia *inferiora vel fere omnia opposita*. Pedicelli *fasciculati vel racemosi*.

* BRACHYCARPÆ. *Pedicelli axillares vel superiores subfasciculati. Folia basi angustata. Capsula ovoidea vel globosa, valvula altera sæpissime majore.*

1. *D. heterandra*, foliis carnosulis profunde pinnatifidis, laciniis inferiorum ovatis superiorum oblongis, sepalis ovato-oblongis obtusis, corolla bifossulata, staminibus inferioribus elongatis difformibus sterilibus.

HAB. Cape Flats, *Drège*. (*v. s.*)

2. *D. diffusa*, foliis pinnatifidis subpinnatisectisve, laciniis ovatis latis, sepalis late lanceolatis acutis, corolla bifossulata, filamentis inferioribus medio bifurcatis, lacinia altera antherifera altera membranaceo-dilatata.

Hemimeris diffusa, *Thunb. Fl. Cap.* 485.

Hemimeris peduncularis, *Lam. Dict.* 3. 105.—*Ill. t.* 532. *f.* 3.

HAB. Near Cape Town and Saldanha Bay, *Ecklon*; Witteboom, *Drège*. (*v. s.*)

Thunberg appears to have confounded two or three species, when he says that the stamina have *often* a membrane in the middle, instead of *always*. Linnæus's *Pæderota Bonæ Spei*. is probably one of the species of this section, but it is impossible to say which.

3. *D. elongata*, foliis infimis pinnatifidis laciniis ovatis, superioribus pinnatisectis laciniis oblongis linearibusve, sepalis late lanceolatis acutis, corolla bifossulata, filamentis inferioribus medio geniculatis integris membranaceo-dilatatis.

Diascia Bergiana, *Herb. Un. Itin. n.* 233.

β. *parviflora*.

HAB. Olifant's river and Brackfontein in Clanwilliam, *Ecklon*; near the Cape, *Sieber* (*n.* 248.); and several other collections. β. Cape Mountains, *Ecklon*; Paarlberg, *Drège*. (*v. s.*)

4. *D. pachyceras* (E. Meyer, MSS.), foliis pinnatifidis laciniis ovato-triangularibus obtusis, sepalis late subcordato-ovatis acuminatis, corolla basi bisaccata, filamentis inferioribus medio incurvis dilatatis.

HAB. Hol river, *Drège*. (*v. s.*)

Flowers drooping, larger and less open than in the neighbouring species.

5. *D. runcinata* (E. Meyer, MSS.) foliis runcinato-pinnatifidis vel sinuato-dentatis, laciniis ovatis oblongisve integris dentatisque, sepalis late cordato-dilatatis

subulato-acuminatis, corolla bifossulata, filamentis omnibus subulatis.

HAB. Zilverfontein, in Namaqualand, *Drège*. (*v. s.*)

Floral leaves few and small. Flowers small.

6. *D. cuneata* (E. Mey. MSS.), foliis infimis runcinato-pinnatifidis, floralibus obovatis oblongisve cuneatis sinuato-dentatis, sepalis late lanceolatis acuminatis, corolla bifossulata, filamentis omnibus subulatis.

HAB. Uitenhage district, on the Zondag river, *Drège*, and on the Zwartkops river, *Ecklon*. (*v. s.*)

** LEPTOCARPÆ. *Pedicelli axillares vel superiores subfasciculati. Folia basi angustata. Capsula oblonga sublinearis.*

7. *D. Bergiana* (Link et Otto, Ic. Pl. Sel. Hort. Berol.), foliis oblongis sinuato-dentatis basi angustatis, sepalis lanceolatis acuminatis, corolla bifossulata.

HAB. Clanwilliam district, near Micren Kasteel, *Drège;* Olifant's river and Brackfontein, *Ecklon*. (*v. s.*)

Habit of *D. runcinata*, but capsule slender, four lines long. Sepals narrow, often joined at the base. Corolla small.

8. *D. Thunbergiana* (Spreng. Syst. 2. 800.), foliis oblongis sinuato-dentatis basi angustatis, sepalis lanceolatis acuminatis, corolla longe bicalcarata.

Antirrhinum longicorne, *Thunb. Fl. Cap.* 483.

Nemesia longicorne, *Pers. Syn.* 2. 159.

HAB. Clanwilliam district, Wupperthal, *Drège;* Olifant's river and Brackfontein, *Ecklon;* Mosselbancks river, Piquetberg and Ribeckkasteel, *Thunberg*. (*v. s.*)

Habit, leaves, calyx, and capsule so nearly those of *D. Bergiana*, that without the corolla it is difficult to distinguish them. This part is, however, about eight or ten lines broad, and at the base instead of the two slight concavities, there are two curved spurs, nearly an inch in length.

9. *D. tanyceras* (E. Mey. MSS.) foliis pinnatifidis, laciniis ovatis oblongis linearibusque, sepalis basi latissimis apice subulato-acuminatis, corolla longe bicalcarata.

HAB. Modderfontein, in Namaqualand *Drège*. I have it also from Captain Paterson's collection. (*v. s.*)

Habit and corolla of D. *Thunbergiana*, leaves and calyx different. I have not seen the capsule.

*** RACEMOSÆ. *Racemi elongati minute bracteati. Folia basi sæpius cordata. Capsula oblonga rarius ovoidea.*

10. *D. macrophylla*, foliis petiolatis ovatis subsinuato-dentatis tenuibus, racemis terminalibus elongatis, corollis longe bicalcaratis, filamentis glabris (?)

Hemimeris macrophylla, *Thunb. Fl. Cap.* 484.

HAB. Between Bockland and Hantom, *Thunberg*. (*v. s. in Herb. Banks. et Linn.*)

A slender annual, six inches to a foot and a half high, and quite glabrous. Leaves few, the lower ones on long petioles. Pedicels six to nine lines long. Corolla larger than in *C. alonsooides*, with spurs about six lines long. Capsules three to four lines long, oblong-linear, slightly curved.

11. *D. parviflora*, foliis breviter petiolatis cordato-ovatis rotundatisve integerrimis dentatisque, racemis terminalibus elongatis multifloris, corollis breviter bisaccatis, filamentis glabris.

HAB. Damp shady places on the Konabs river, in the Ceded Territory, *Ecklon;* mountainous places on the Hex river, *Drège*. (*v. s.*)

Racemes longer and much more slender than in *D. alonsooides*. Pedicels filiform, nearly half an inch long. Flowers drooping, about a line and a half broad.

12. *D. alonsooides*, foliis petiolatis subcordato-ovatis subsinuato-dentatis tenuibus, racemis terminalibus elongatis multifloris, corollis brevissime bifossulatis, filamentis villosis.

HAB. Sneeuwebergen, *Drège*. (*v. s.*)

An erect glabrous annual, nine inches to a foot high. Pedicels filiform, at length near an inch long. Bracts very small, cordate. Corolla half an inch broad, with the segments rounded, and nearly equal in size. Capsule three lines long, oblong, tapering towards the end.

13. *D. racemulosa*, ramis tetragonis

subalatis, foliis late cordato-ovatis dentatis, racemulis axillaribus tenuibus, corollis calcaratis, filamentis glabris.

Hab. In the Amaponda country, between Umtata and Umzimcoolu. *Drège.* (*v. s.*)

Differs in habit from all the other species. Stems branched and leafy in the upper part. Racemes short, slender, and numerous. Pedicels short. Corolla of the size of that of *D. alonsooides,* but with two short very divergent spurs. Like many of the *Diasciæ,* however, it is so difficult to unfold from a dried specimen, that I have been unable to ascertain its precise form.

14. *D. capsularis,* basi ramosa, foliis subsessilibus cordato-ovatis vel ovato-lanceolatis dentatis, racemis terminalibus elongatis, corollis bicalcaratis, capsulis ovoideo-oblongis calyce bis terve longioribus.

Hab. In the hills of Uitenhage and Albany district, at Ado, and various other places, *Ecklon.* (*v. s.*)

Perennial, a foot high, leafy near the base. Branches sharply quadrangular. Leaves rather thick. Pedicels half an inch to an inch. Bracts very small. Sepals oblong or lanceolate, with a few glandular hairs. Spurs of the corolla conical, straight, about three lines long; limb eight to ten lines broad. Capsule about four lines long.

15. *D. rigescens* (E. Mey. MSS.), caule erecto elato stricto, foliis sessilibus amplexicaulibusve cordato-ovatis dentatis, racemis elongatis terminalibus multifloris, corollis breviter bicalcaratis, capsulis subgloboso-ovatis calycem vix æquantibus.

β. angustifolia.

Hab. On the Katriviersberg and Winterberg, *Ecklon;* on the Katberg, *Drège;* β. in the Amaponda country, between Umzimwoobo and Umzimcoolu, *Drège.* (*v. s.*)

Stem slightly branched, above two feet high. Leaves larger and more sharply toothed than in *D. capsularis.* Sepals oblong or spathulate, obtuse, with glandular hairs. Spurs of the corolla scarcely two lines long. Filaments glabrous. Capsule coriaceous, scarcely two lines long.

16. *D. denticulata,* decumbens, foliis sessilibus ovato-lanceolatis oblongisve obtusis paucidentatis, racemis terminalibus brevibus subcorymbosis, corollis breviter bicalcaratis.

Hab. In the Amaponda country, between Umtata and Umzimcoolu, *Drège.* (*v. s.*)

Leaves thick as in the two last species, but smaller and narrower, obscurely toothed. I have not seen the capsule.

17. *D. integerrima* (E. Mey. MSS.), foliis brevissime petiolatis integerrimis, inferioribus ovato-lanceolatis, superioribus lanceolato-linearibus, racemis elongatis terminalibus, corollis bicalcaratis, capsulis oblongis calyce bis terve longioribus.

Hab. Los Tafelberg and Witbergen, *Drège.* (*v. s.*)

Near *D. capsularis,* but more slender, with the leaves much smaller, and very narrow, and smaller flowers.

V. Nemesia. *Vent.*

Calyx 5-sepalus. *Corolla* basi saccata vel calcarata, limbo personato bilabiato, labio superiore 4-fido, inferiore integro vel emarginato, palato convexo. *Stamina* 4-didynama, inferiora longiora, basi circumflexa superiora cingentia; antheræ uniloculares per paria sæpissime cohærentes. *Capsula* compressa, septicido-bivalvis, valvulis navicularibus subcarinatis apice oblique truncatis, latere exteriore acuto vel breviter cornuto, rarius apice rotundatis. *Semina* oblonga, ala membranacea cincta. —Herbæ *annuæ, rarius perennes vel suffrutices.* Folia *opposita.* Flores *racemosi vel rarius axillares.*

* *Corolla basi saccata.*

1. *N. strumosa,* herbacea, erecta, foliis radicalibus oblongo-spathulatis integris, caulinis lanceolatis linearibusve dentatis, racemis brevibus subcorymbosis, corollis amplis basi late saccatis, laciniis late rotundatis.

Antirrhinum strumosum, *Herb. Banks. MSS.*

Hab. Saldanha Bay, in the Cape district, *Ecklon, Drège,* &c. (*v. s.*)

A foot high, branched at the base.

Leaves few, glabrous as well as the stem. Floral leaves or bracts small. Pedicels at length one to one and a half inch long, hairy as well as the linear sepals. Corolla about an inch in diameter when fully expanded, orange, yellow, or purple, lower lip bearded with long hairs. Capsule ovate, four to six lines long, three to four broad, slightly contracted at the top, valves obliquely truncate by a straight or slightly incurved line, and forming a very broad angle with each other.

2. *N. saccata* (E. Mey. MSS.), herbacea, humilis, basi ramosissima, foliis linearibus integerrimis paucidentatisque, racemis elongatis, corollis parvis basi late saccatis, laciniis rotundatis.

Hab. Sands near Noagas, *Drège.* (*v. s.*)

Scarcely six inches high, and entirely glabrous. Leaves somewhat fleshy. Pedicels distant, half an inch long. Corolla three to four lines broad, not bearded. Anthers scarcely cohering. Capsule two to two and a half lines long and broad, not narrowed at the end, valves rounded at the extremity, forming a very open angle with each other.

3. *N. lucida*, herbacea, glaberrima, foliis cordato-ovatis grosse dentatis, inferioribus breviter petiolatis, racemis elongatis paucifloris, corollis parvis basi late saccatis laciniis rotundatis.

Hab. Constantia, *Ecklon.* Occurs in several Cape collections. It is Sieber's n. 254. (*v. s.*)

Stems a foot or a foot and a half high, four-angled, smooth, and shining. Leaves rather more than an inch long. Pedicels distant, an inch long. Capsule six to seven lines long, two broad, not contracted at the top, valves very obliquely truncate, with the outer corner sharp. Corolla of *N. saccata.*

** *Corolla calcarata. Flores racemosi.*

4. *N. barbata*, herbacea, erecta, foliis radicalibus petiolatis ovatis subintegerrimis, caulinis sessilibus ovatis oblongisve dentatis, racemis paucifloris, corollæ labii superioris laciniis brevibus rotundatis, inferiore maximo vix emarginato, calcare brevi conico.

Antirrhinum barbatum, *Linn.—Thunb. Fl. Cap.* 482.

Hab. Cape and Stellenbosch districts, also in Clanwilliam, at Olifant's river, and Brackfontein, *Ecklon.* (*v. s.*)

Nearly a foot high, branched at the base, glabrous, or with a few glandular hairs on the upper part of the stem, the peduncles, and calyx. Corolla variable in size, but readily known by the large broad lower lip retaining a dark colour in the dry state. Lower lip bearded. Capsule ovate, narrowed at the top with two short diverging horns.

5. *N. cheiranthus* (E. Mey. MSS.), erecta, glabra, foliis infimis ovatis petiolatis, superioribus paucis remotis sessilibus oblongis lanceolatis linearibusve, omnibus paucidentatis integerrimisve, corollæ laciniis supremis lanceolatis acutis labio inferiore longioribus, palato villoso, calcare brevi conico.

Hab. Clanwilliam district: between Heerenlogiment and Knakasberg, *Drège;* Olifant's river and Brackfontein, *Ecklon.* (*v. s.*)

A foot high, not much branched. Calyx and peduncles sometimes bearing a few short hairs. Two upper divisions of the corolla six lines long, lateral ones four lines, spur two lines long, lower lip broad and emarginate. I have not seen the capsule.

6. *N. anisocarpa* (E. Mey. MSS.), erecta, subglabra, foliis infimis petiolatis ovatis, superioribus paucis remotis sessilibus oblongis lanceolatis linearibusve integerrimis dentatisque, corollæ laciniis supremis oblongis obtusis labio inferiore longioribus, palato tenuiter pubescente, calcare brevi recto lineari-conico.

Hab. Micrenkasteel in Clanwilliam, and Zilverfontein in Namaqualand, *Drège.* (*v. s.*)

Habit, leaves, and calyx of *N. cheiranthus,* from which it chiefly differs by the upper divisions of the corolla much broader and obtuse. In the Zilverfontein specimens they appear still shorter than in the Micrenkasteel ones. In the latter the capsule is four lines long, two and a half broad, the valves contracted at the top, and une-

qual in size at the base. In the other specimens the capsule is not yet formed.

7. *N. versicolor* (E. Mey. MSS.), erecta, subglabra, foliis infimis petiolatis ovatis, superioribus paucis remotis sessilibus oblongis anceolatis linearibusve integerrimis dentatisque, corollæ laciniis 4 superioribus oblongis obtusis inter se æqualibus labio inferiori æquilongis, palato bicalloso pubescente, calcare incurvo apice non dilatato labio inferiori vix æquilongo.

β. oxyceras.

Hab. Olifant's river and Brackfontein, in Clanwilliam, *Ecklon ;* Zilverfontein, in Namaqualand, *Drège.* β. in Clanwilliam, between Heerenlogiment and Knakasberg, *Drège.* (*v. s.*)

Habit of the two last. Spur about four lines long. Capsule three lines long and broad, rounded at the base, not contracted at the top, valves rounded at the top with the outer corner pointed. In the variety β. the spur is sharper, and the flowers of a deep yellow. I have not seen the fruit.

8. *N. ligulata* (E. Mey. MSS.), erecta, subglabra, foliis infimis petiolatis ovatis superioribus paucis remotis sessilibus oblongis lanceolatis linearibusve integerrimis dentatisque, corollæ laciniis supremis oblongis lateralibus obovatis labio inferiori subæquilongis, calcare labio inferiore parum longiore apice subfalcato-dilatato.

Hab. Hol river, *Drège.* (*v. s.*)

Habit of the three last. Raceme pubescent. Flowers rather smaller than those of *N. versicolor,* deep yellow. Spur three lines long.

9. *N. calcarata* (E. Mey. MSS.), erecta, subglabra, foliis infimis petiolatis ovatis superioribus paucis remotis sessilibus oblongis lanceolatis linearibusve dentatis, corollæ laciniis superioribus obovatis (?) inter se et labio inferiori subæquilongis, calcare rectiusculo apice attenuato labio inferiori subduplo longiore.

Hab. Between Hex river and Draai, *Drège.* (*v. s.*)

Capsule of *N. versicolor,* from which it chiefly differs by the short upper divisions of the corolla, and the spur near six lines long.

10. *N. parviflora,* erecta, subglabra, foliis inferioribus petiolatis ovatis superioribus paucis remotis sessilibus oblongis vix dentatis, corollæ parvæ laciniis superioribus oblongis labio inferiori brevioribus, calcare recto labio superiore subæquilongo, capsulis apice non dilatatis.

Hab. Mountains near the Cape, *Ecklon.* (*v. s.*)

Stems slender, nearly simple. Racemes loose, with filiform pedicels. Corolla scarcely longer than in *Linaria simplex,* bright yellow, with an apparently purplish spur. Capsule near two lines long and broad.

11. *N. pinnata* (E. Mey. MSS.), erecta, pusilla glabriuscula, foliis remotis linearibus profunde dentatis pinnatifidisve laciniis linearibus, corollæ parvæ labio superiore brevissimo, calcare recto labio superiore longiore inferiore breviore.

Antirrhinum pinnatum, *Linn.! Suppl.* 280.

Habit of *N. parviflora.* Flowers of the same size, but with a very short upper lip. Capsule the same.

12. *N. gracilis,* erecta subglabra, foliis inferioribus petiolatis ovatis, superioribus paucis remotis sessilibus oblongis vix dentatis, corollæ parvæ laciniis superioribus oblongis labio inferiore subdimidio brevioribus, calcare recto labio superiore longiore, capsulis basi contractis apice dilatatis subbicornibus.

Hab. Olifant's river and Brackfontein, in Clanwilliam, *Ecklon.* (*v. s.*)

Very much like *N. parviflora,* but flowers rather larger (about four lines long with the spur), and capsule of the form of that of *N. bicornis,* although much smaller.

13. *N. bicornis* (Pers. Syn. 2. 159.), erecta, pilis sparsis brevibus pubescens vel subglabra, foliis infimis petiolatis ovato-oblongis superioribus paucis remotis sessilibus oblongis lanceolatis linearibusve dentatis, racemis demum ramosis, corollæ laciniis 4 superioribus oblongis obtusis labio inferiore bifido subæquilongis, palato bicalloso villoso, calcare lineari labio inferiore breviore, capsula basi contracta apice dilatata breviter bicorni.

Antirrhinum bicorne, *Linn.*—*Thunb. Fl. Cap.* 482.

HAB. Very common about the Cape, from whence it is frequently sent, and extends northwards towards Heerenlogiment, in Clanwilliam, *Drège.* (*v. s.*)

Near *N. versicolor*, but taller, more branched, and more generally pubescent. Leaves always toothed. Readily known when in fruit, by its capsules, which have the shape of two nearly right angled triangles joined together by one of the sides of the right angle, the other side being a curved line, ending in a projecting point. The corolla is about the size of that of *Linaria striata*, and usually streaked in a similar manner, but with a much less prominent palate.

14. *N. affinis*, erecta, subglabra, foliis infimis petiolatis ovatis oblongisve superioribus paucis subsessilibus oblongis lanceolatis linearibusve plerisque dentatis, corollæ laciniis 4 superioribus oblongis obtusis inter se et labio inferiori subæquilongis, palato tenuissime pubescente, calcare subrecto obtuso labio inferiori subæquilongo, capsula ovata submutica.

β. latifolia.

γ. grandiflora.

HAB. Cape and Stellenbosch districts, *Ecklon*; *β.* Uitenhage and Albany districts, *Ecklon, Drège, &c.*; *γ.* Zwarteland, *Ecklon*; Algoa Bay, *Forbes.* (*v. s.*)

Nearly allied to *N. versicolor* and *N. bicornis*, with the habit of the former, but differing from both by the form of the capsule, which is longer than it is broad, contracted at the top, with the valves truncate. The variety *β.* is usually lower and more branched, with a rather longer capsule. The variety *γ.* has also rather broad leaves.

The eleven preceding species differ chiefly from each other in the form of the corolla and of the capsule, but the former character is often difficult to observe in dried specimens, and the capsules are but too frequently wanting. There are, therefore, many specimens in the Banksian and other Herbaria, as well as in the collections before me, that I am unable to determine with certainty, and it is probable that amongst them there may still be several new species.

15. *N. cynanchifolia*, ramosissima, diffusa, ramis foliosis pubescentibus, foliis petiolatis ovato-lanceolatis obtusis obscure sinuato-dentatis glabris, corollæ labio superiore trifido lacinia intermedia breviter bifida omnibus obtusissimis labio inferiore vix longioribus, calcare recto labio inferiore parum breviore, palato glabriusculo.

HAB. Rocks of the Sneeuwebergen, *Drège.* (*v. s.*)

In habit comes near *N. affinis β*, but the leaves are all petiolate, the lower floral ones often similar to those of the stem, the divisions of the corolla broader, the two upper ones connected together beyond the middle. I have not seen the capsule.

16. *N. viscosa* (E. Mey. MSS.), ramosissima, viscoso-pubescens, foliis brevissime petiolatis ovato-lanceolatis acutis integerrimis, corollæ laciniis 4 superioribus ovatis obtusissimis labio inferiore vix longioribus, calcare recto labio inferiore breviore, palato glabriusculo.

HAB. At Verleptpraam and on the Gariep, *Drège.* (*v. s.*)

A low branching plant, with much of the habit of *N. cynanchifolia.* Sepals lanceolate, very sharp. Corolla smaller than in the last species. Capsule five lines long, three broad, scarcely narrowed at the top, with two very short horns.

17. *N. linearis* (Vent. Jard. Malm. sub. t. 41.), perennis vel suffruticosa, glabra, ramis adscendentibus, foliis lineari-lanceolatis integerrimis pauci-dentatisque, corollæ labiis subæqualibus, superioris laciniis brevibus obtusis, calcare recto labiis breviore, palato villoso, capsulæ valvulis apice rectis.

Antirrhinum capense, *Thunb. Fl. Cap.* 481.

Linaria capensis, *Spreng. Syst.* 2. 796.

HAB. Karroo and Karroid places in the districts of George, Swellendam, Uitenhage, Beaufort, &c., *Ecklon, Drège,* and most collections. (*v. s.*)

The capsule varies in length and breadth, and is either narrowed or straight at the top, but is never two-horned, and the valves are always rounded at the top.

18. *N. fœtens* (Vent. Jard. Malm. t. 41.), "foliis quaternis lineari-lanceolatis acutis subtrinerviis glabris, floribus racemosis terminalibus bracteatis." Vent.

Hab. Cape of Good Hope, *Ventenat.*

19. *N. divergens*, perennis?, glabra, ramis adscendentibus, foliis lineari-lanceolatis integerrimis dentatisve, corollæ labiis subæqualibus superioris laciniis brevibus obtusis, calcare recto labiis breviore, palato villoso, capsulis apice bicornutis.

Hab. Zwartehoogdens in Albany, *Ecklon.* (*v. s.*)

Habit and corolla of *N. linearis*. Capsules of *N. barbata*.

*** *Corolla calcarata. Flores axillares rarius racemosi foliis floralibus inferioribus caulinis subconformibus.*

20. *N. fruticans*, "foliis oppositis ovatis integris hirtis, caule fruticoso." *Thunb.*

Antirrhinum fruticans, *Thunb. Fl. Cap.* 483.

Hab. Cape of Good Hope, *Thunberg.*

I have seen nothing which answers to the description of this plant, but from what Thunberg says of the capsule, it is certainly a *Nemesia.*

21. *N. acuminata*, procumbens, glaberrima, lucida, foliis sessilibus cordato-ovatis longe acuminatis argute dentatis, floribus in axillis superioribus vel ad apices ramorum, racemulosis, corollæ labiis subæqualibus, palato pubescente, calcare labiis breviore, capsula apice dilatata acute bicornuta.

Antirrhinum scabridum, *Herb. Banks. MSS.*

Hab. Cape of Good Hope, *Masson.* (*v. s. in Herb. Banks.*)

Differs from *N. diffusa* by its larger flowers and leaves, and especially by the capsule, which is nearly that of *N. bicornis.*

22. *N. diffusa*, ramosissima, procumbens, glaberrima, lucida, foliis parvis breviter petiolatis ovatis vel ovato-lanceolatis infimis obtuse superioribus acutissime dentatis, floribus axillaribus vel supremis laxissime subracemosis, corollis parvis, labiis subæqualibus, palato pubescente, calcare brevi recto.

β. rigida.

Hab. Cape, Stellenbosch, and Swellendam districts, *Ecklon, Drège,* &c. *β.* on the Palmiet river, *Ecklon.* (*v. s.*)

Habit in some measure that of *Linaria ramosissima.* Branches and pedicels filiform. Corolla nearly that of *N. lucida,* but with a short linear spur. Capsule oblong ovate, narrowed at the base, straight towards the top, the valves obliquely truncate, not rounded. In the var. *β.* the flowers and leaves are rather larger.

23. *N. chamædryfolia* (Vent. Jard. Malm. sub t. 41.), herbacea, foliis subsessilibus ovatis dentatis basi rotundatis subcordatisve, floralibus subconformibus, pedicellis axillaribus, corollæ labii superioris laciniis brevibus rotundatis inferiore integro parum longiore, calcare brevi conico.

Antirrhinum macrocarpum, *Ait. Hort. Kew.*

Antirrhinum scabrum, *Thunb. Fl. Cap.* 483.

Linaria scabra, *Spreng. Syst.* 2. 792.

Hab. On the Table Mountain, *Drège, Ecklon* (Herb. Un. Itin. n. 556.); *Cayley,* &c. (*v. s.*)

Whole plant glabrous and drying black. Upper lip of the corolla three lines long, lower one three and a half, not bearded. Sepals oblong, narrowed at both ends, rather shorter than the capsule, which is from three and a half to four lines long and broad, truncate at the top.

24. *N. melissæfolia*, herbacea, glaberrima foliis petiolatis ovatis vel ovato-lanceolatis dentatis incisisve, racemis brevibus, foliis floralibus infimis caulinis subconformibus, corollæ labiis subæqualibus calcare lineari corollam æquante.

Hab. Karroo, *Drège;* Fort Beaufort, Philipstown, and Zwartehoogdens, *Ecklon.* (*v. s.*)

Above a foot high. Branches leafy. Leaves of *N. lucida,* but all stalked. Pedicels long, filiform, often fasciculate. Corolla of *N. lucida,* but with a spur two lines long. Capsule six lines long, four broad, the valve obliquely truncate.

25. *N. pubescens*, herbacea, pubescens vel pilosa, foliis petiolatis ovatis dentatis

floralibus subconformibus, floribus inferioribus axillaribus superioribus subracemosis, corollæ labiis subæqualibus, calcare corolla breviore.

Hab. Graafreynet and Keurebooms river, *Drège*. (*v. s.*)

Near *N. melissæfolia*, but besides the above characters the capsule is shorter.

VI. Diclis.

Calyx 5-sepalus. *Corolla* personata, basi calcarata, labio superiore bifido, inferiore trifido. *Stamina* 4, didynama, inferiora longiora basi circumflexa. *Antheræ* uniloculares per paria cohærentes. *Capsula* subglobosa, emarginata, loculicido-bivalvis, valvulis integris vel vix fissis. *Semina* pauca ovoidea striata.—Herbæ *Austro-Africanæ*. Caules *repentes*. Folia *opposita, petiolata, lata, dentata*. Pedicelli *solitarii, axillares, uniflori, ebracteati*.

1. *D. reptans*, foliis subrotundis, basi truncatis cordatisve.

Hab. Eastern districts of the Cape Colony, on the Vanstaadensriviersberge and Zuureberge in Uitenhage, the Winterberg in the Neutral Territory, and Katberg in Cafferland, *Ecklon*; in the Amakosa and Amaponda countries, *Drège*. (*v. s.*)

Stems long, creeping, and often throwing out roots from the knots, and as well as the leaves are usually more or less pubescent, sometimes glabrous, and generally drying black. Leaves an inch broad, or rather more, crenate. Sepals oblong-linear, nearly equal. Corolla including the spur, about seven lines long; lower lip twice as long as the upper one. Capsule covered with glandular hairs, about the length of the calyx, and broader than it is long.

2. *D. ovata*, diffusa, foliis late ovatis basi cuneatis.

Hab. Madagascar. (*v. s. in Herb. Hooker.*)

Flowers half the size of those of *D. reptans*. Capsule nearly glabrous.

LACIS CERATOPHYLLA.

Tab. XX.

Gen. Char. Nat. Ord.—Podostemoneæ. *Rich.*

Flores spathacei, partibus appendiciformibus numero indefinitis. *Stamina* indefinita (2—40), hypogyna, libera v. monadelpha. *Stigmata* 2. *Capsula* striata, bilocularis, bivalvis. *Semina* numerosa, receptaculo centrali affixa.—Herbæ *humiles aquatiles præcipue tropicæ; scaturigines rivulosque amantes, saxis rupibusve, imo et arboribus radicibus suis adnatæ, plerumque submersæ.* Folia *multipartita, laciniis sæpe angustis.*

Lacis *ceratophylla*; repens, caule filiformi flexuoso, foliis multipartitis laciniis linearibus, floribus axillaribus solitariis, staminibus 2 filamentis monadelphis. (Tab. XX.)

Lacis ceratophylla. *Bongard, Gen. Lacis Revis. p.* 10. Podostemon ceratophyllus, *Mich. Am. v.* 2. *p.* 164. *t.* 44. *Nutt. Gen. Am. v.* 2. *p.* 202.

Hab. Stony beds of rivers in the southern States of North America; Ohio, near Louisville, *Michaux*; Delaware, about Easton, *T. Collins, Esq.*; Holston, Kenhaway, French Broad, and in the Catawba river, near Morganton, North Carolina, *Nuttall*; Augusta, Georgia, *Dr. Leavenworth*; Brandywine, and various streams about West Chester, Pennsylvania, *Dr. Darlington, Mr. Townsend*; Rapids of the Kentucky river, *Dr. Short*.

Interested as I have long been in the vegetation of North America, I could not but feel desirous of possessing a plant which few Botanists were acquainted with except through the figure and description of Michaux, namely, his *Podostemon ceratophyllus*, the only individual of the Order found in North America; the others being natives of the tropics, and chiefly of Brazil and Guiana. But it was long ere I could obtain a specimen, for its place of growth, attached to stones at the bottoms of rivers, had caused it to be overlooked: nor was it till I applied to my obliging correspondents, Dr. Short, of Kentucky, and Dr. Darlington, of West Chester, that I received any. From those gentlemen I have been

favoured with copious specimens both dried and preserved in alcohol: from the former Botanist I have an excellent figure, and from the latter a full and accurate description made from recent specimens, from which the annexed plate and the following history are mainly taken.

Root consisting of fleshy processes at the lower part of the plant, which adhere closely to the stones on which the plant grows, somewhat after the manner of the roots of *Ampelopsis hederacea* on *Bignonia radicans*. *Stems* roundish, smooth, fleshy, and somewhat coriaceous, running over the surface of the pebbles, and closely adhering to them by means of the small fleshy processes just described, which are frequently thrown out from the stem, especially where it ramifies. *Branches* numerous, and where the stem adheres to the pebbles, the branches are nearly at right angles with it, opposite or alternate. The creeping stems frequently extend beyond the stone on which the plant originated, and attach themselves to other small pebbles around; so that if you pick up the principal pebble, the stems, or their ramifications, will bring up a number of small pebbles hanging to them. Before flowering, and particularly where the water is several inches deep, a number of branches are sent up, from one to three inches long. The *leaves*, in regard to texture and general appearance, would seem to be a prolongation of the stem, being almost equally coriaceous, half an inch to nearly an inch in length, the lower half forming a kind of petiole, with a sheathing membranous process at the base, which partly embraces the stem, and the base of flowers: the upper half is divided in a somewhat dichotomous manner, two or three times, into linear, rather acute, flat or slightly furrowed segments, bearing a resemblance to some branched *Cenomyce*, or the antlers of a buck: but in drying, these segments shrink and become almost setaceous, from which state of the plant Michaux's figure seems to have been taken. The *flowers* emerge from the axils of the leaves (which are more crowded above) and the peduncles of the flower-buds are embraced by the short, fleshy sheathing process on the base of the petioles. *Spatha* obovate, coriaceo-membranaceous, formed of one piece ruptured by the protrusion of the flower from within, or rather of the stamens which seem to be the first protruded; and this rupture is often effected by carrying away a portion of the apex, according to Dr. Darlington's observations. This *spatha* contains what is usually considered a single flower, but which I am rather led to consider as two, a *male* and *female*, at the extremity of a peduncle so short as to be mostly included within the ruptured spatha (f. 4). In a young state, before the expansion of the flowers, the anthers are close pressed against the germen, and lodged just beneath the incurved stigmas. *Stamens* two, (occasionally three, *Dr. Darlington*); arising from the base of the germen: the filaments combined more than half way up, or monadelphous. *Anthers* ovate, opening towards the pistil, two-celled. At the base of these united filaments, one on each side, are two subulate appendages, shorter than the real filament. *Pistil* solitary, sessile, oval, dark green, marked with elevated purple lines. *Stigmas* two, sessile, fleshy, lanceolato-subulate. *Capsule* oval, striated, two-celled, two-valved, bearing numerous seeds upon a central receptacle.

Dr. Darlington further observes, that this plant flourishes best, and bears most fruit when growing in shallow water, so as to be situated near the surface, and even exposed when the streams are low. In removing specimens into a tin box, when they have been near flowering, he has found that the stamens would burst forth in a few hours: whereas, if left *under water*, the flowers would remain stationary, with the stamens included in the spatha for a number of days.

TAB. XX. Fig. 1. Pebble to which plants of *Lacis ceratophylla*, *nat. size*, are attached. 2. Base of the leaves containing a flower-bud enclosed in its spatha, which latter is in the act of bursting. 3. Flower taken out of the same, showing how the Stamens (or male flower?) are applied to the Pistil (or female flower?) before expansion. 4. Perfect flower protruded beyond the spatha. 5. Flowers removed from the spatha. 6. Capsule bursting open. 7. Transverse section of a scarcely mature Capsule:—all but fig. 1 *magnified*.

ERYTHROXYLON COCA: OR COCA-SHRUB OF PERU.

TAB. XXI.

At p. 161 of this Journal, I have given, from the Travels of Dr. Pöppig in South America, a highly interesting account of the uses and property, mode of cultivation, and commercial value of the *Coca Shrub*, and it was matter of regret that it was not in my power to accompany that history with a *figure* of so celebrated a plant. The fact was, I did not possess it in my Herbarium. But shortly after, on turning over the specimens in Mr. Mathews's private Herbarium, which happened at the time to be in my possession, I there found a beautiful one from the Quebrada of Chinchao; the ticket accompanying it bearing the number 2023. Yet strange to say, this species of *Erythroxylon* does not appear to have been yet distributed to Mr. Mathews's subscribers; perhaps because he looked upon it as too common. I have indeed often had occasion to regret, when Botanists make collections in remote and little frequented countries, how often they neglect to procure specimens of the more useful plants, whether in the arts, or in medicine, or in commerce: and can only account for this upon the ground, that such plants being familiar to the inhabitants, they are passed by as of little value to the Botanist. We have only to look at the pages of any work on Materia Medica, where doubts or ignorance are expressed in regard to a great number of vegetables yielding some of our most valuable drugs, to be satisfied of the correctness of this remark.

In regard to the plant in question, indeed, it is not unknown to Botanists and travellers, though no doubt imperfectly to many who have written on it. Clusius and Hernandez speak of it. Lamarck first clearly defined it, having described it from specimens brought from Peru, by Joseph de Jussieu. Cavanilles figured and described it from the same specimens: and we have also a representation of it in the inedited plates of Ruiz and Pavon. The two latter works, however, containing the figures, are in the hands of few: so that the one here given and made from Mr. Mathews's specimen may not be unacceptable to our friends, and it now only remains to offer a brief description.

Erythroxylon *Coca;* foliis ovalibus acutis submembranaceis opacis reticulatis (præter costam) lineis duabus notatis, pedunculis lateralibus fasciculatis longitudine florum, fructibus ovatis acutis, ramis crebre tuberculatis. (TAB. XXI.)

Erythroxylon Coca. *Lam. Dict. v.* 2. *p.* 593. *Cav. Diss. p.* 402. *t.* 229. *De Cand. Prodr. Ruiz, et Pav. Fl. Per. ined. t.* 398. *Mathews, Herb. Peruv. n.* 2023.

HAB. Peru. In the environs of Cuchero and on the stony summit of Cerro de San Christobal, *Dr. Pöppig* thinks it *may* be indigenous. Cultivated extensively in the Andes, and at an elevation of from 2,000 to 9,000 feet above the level of the sea.

DESCR. A *Shrub*, according to Mr. Mathews' notes, from four to eight feet high, erect, much branched; the branches alternate, erecto-patent, clothed with a pale brownish *bark*, much wrinkled and furrowed, the elevated lines between these furrows beset with numerous whitish tubercles, which when seen under a lens, appear to be formed of two curved lines, set face to face, so that they look like very large stomata of the epidermis. *Leaves* alternate, chiefly confined to the upper parts of the branches, one and a half to two inches long, membranaceous, flat, opaque, acute at both extremities, the apex almost mucronate, quite entire, dark green above, pale beneath: costa or midrib slender, sending forth at nearly right angles slender nerves, which anastomose over the surface of the leaf, but are connected with two principal nerves, which form a slightly curved line from the base to the apex, between the costa and margin, but nearest to the former: these are more conspicuous on the under surface than the upper, and are rendered more evident from the circumstance of the disc of the leaf between the two parallel nerves being more sunk than the rest of the surface, and slightly

differing in colour. *Petiole* two to four lines long, with a pair of intra-petiolary ovato-lanceolate brown acute *stipules*, upon the back of the outer of which, indeed, the petiole is articulated, and from which the leaf readily falls away, leaving the branches scaly with the persistent stipules. *Flowers* numerous, in fascicles from the branches where the leaves have fallen away, bracteated. *Peduncles* about as long as the flower, sharply angled. *Calyx* five-fid, the segments acute. *Petals* alternate with the calycine segments, oblong, concave, wavy, with a laciniated and much plaited membrane arising from within above the base. *Stamens* ten: *filaments* longer than the pistil, combined below into a rather short cylindrical tube. *Germen* oval. *Styles* three, about as long as the germen. *Stigmas* thickened. *Fruit* a one-seeded, oblong drupe, in a dry state obscurely furrowed. *Nut* of the same shape and furrowed.

Fig. 1. Flower. 2. Petal. 3. Stamens. 4. Pistil. 5. Fruit. 6. Nut from the Drupe:—*magnified.*

A MONOGRAPH OF THE NORTH AMERICAN SPECIES OF RHYNCHOSPORA.

By Asa Gray,[1] M.D.

(*Extracted from the Annals of the Lyceum of Nat. Hist. of New York, vol.* 3.)

The Natural Order Cyperaceæ has, in proportion to the number of species it comprises, been less carefully studied than any other family of Phænogamous Plants. Notwithstanding the researches of R. Brown, Nees von Esenbeck, Kunth, &c. who have illustrated particular portions of this family, the distinctive characters of the genera are, in many cases, highly unsatisfactory, and the determination of species is frequently difficult. The whole Order requires an elaborate revision by some competent person, who can consult the principal Herbaria of preceding Botanists, as well as many important works which, from their great cost or extreme scarcity, are inaccessible to us. But the plants of any single country may be most advantageously studied by a Botanist who is familiar with them in their native situations, and who has opportunities of examining and comparing numerous specimens from various localities.

A person who in this way confines his attention, for a time at least, to the critical examination of a single genus or family of plants, and who carefully records the facts which he observes, may furnish important materials to those who, with more ample means, are to succeed him in the same field; and thus contribute, in some degree, to the advancement of the cause of Science.

The following account of the North American species of *Rhynchospora* has been prepared under circumstances highly favourable for arriving at correct results. With a liberality which does honour to the cause in which they are engaged, my botanical friends have placed their collections at my disposal, or permitted me to examine them; and have, in various ways, favoured me with important assistance. Since this paper was prepared for the press, I have had the opportunity of consulting the MSS. and original Herbarium of the late Dr. Baldwin, now in the possession of Dr. Torrey: among the former are detailed descriptions of all the species of *Rhynchospora* which his Herbarium comprises. It appears that he paid much attention to this genus and the *Cyperaceæ* in general, and many of his observations are valuable. I have adopted the specific names proposed by Dr. Baldwin, except in cases where they are objectionable.

By far the greatest number of the species of *Rhynchospora* are natives of America. The *Systema Vegetabilium* of Sprengel, the latest enumeration I have seen, comprises thirty-eight species, exclusive of five species of *Carpha* of R. Brown, which are by Sprengel referred to this genus. To these we may add five species from Rœmer and Schultes' *Mantissa*, vol. II., which increases the number to forty-three. Of these, thirty are natives of America, six of New Holland, four of the East

[1] Author of the admirable work of "Specimens of North American *Grasses and Cyperaceæ*," mentioned at vol. I. p. 14 of this Journal.

Indies, one of the Cape of Good Hope, and two are common both to Europe and North America.

In Willdenow's *Species Plantarum,* two species of *Rhynchospora* are described as natives of North America, viz. *Schœnus glomeratus* and *cymosus.* Lamarck, in the 1st vol. of his *Illustrations of the Genera of Plants,* has imperfectly characterized three species, collected in Carolina and Florida, by Mr. Fraser. Two of these can be satisfactorily determined, and to these the specific names of Lamarck must be restored, to the exclusion of those conferred by later authors. Michaux, in his *Flora Boreali-Americana,* has enumerated nine species, and they are, for the most part, very accurately described. The *Descriptio Uberior Graminum* of Muhlenberg contains detailed descriptions of thirteen species of this genus. Specimens of many of these, however, do not exist in his Herbarium; and those which have a place there, are in such a state of confusion (there being often three or four species with a single label), that little information is to be obtained by consulting it.

The species of *Schœnus,* with hypogynous bristles and a subarticulated tubercle, were separated to form the genus *Rhynchospora,* by Vahl, in the 2nd vol. of his *Enumeratio Plantarum,* published in the year 1806. His specific characters are drawn almost entirely from the culm, leaves, and inflorescence,—characters of minor consequence,—to the exclusion of the much more eligible and important ones furnished by the spikelets, bristles, and fruit. Consequently, there remain some doubts as to the synonymy of Vahl, which can only be removed by the examination of his original specimens.

Pursh appears not to have studied this genus with care. In the *Flora Americæ Septentrionalis* ten species are enumerated, and the specific characters of Vahl are quoted without alteration.

The late Mr. Elliott, in the *Botany of South Carolina and Georgia,* has described thirteen species of *Rhynchospora.* Although the synonymy is often inaccurate, yet his detailed accounts are so far correct, that we have little difficulty in determining the plants to which they are intended to apply. In a few cases, moreover, I have had the opportunity of examining authentic specimens labelled by Mr. Elliott, and by him communicated to Dr. Torrey.

RHYNCHOSPORA. *Vahl.*
Schœni species, Linn.—*Chætospora,* H. B. K.—Nat. Ord. *Cyperaceæ.*
TRIANDRIA MONOGYNIA.

SPICULÆ pauciflorae; glumis undique imbricatis, inferioribus vacuis. SETÆ hypogynæ plerumque sex. NUX indurata, basi styli persistente subarticulata.

Culms mostly simple, triangular or subterete, leafy. *Inflorescence* corymbose, paniculate or fasciculate, rarely capitate. *Corymbs* one or several, terminal or lateral, mostly single, but sometimes two or three emerging from the same sheath. *Spikelets* ovate or lanceolate, few-flowered. *Glumes* imbricated on every side, one-nerved, cuspidate: the inferior ones shorter and empty. *Perianthium* composed of a definite number of hypogynous bristles. *Bristles* five to twelve, but for the most part, six, in two series; the three outer ones opposite to, and the three inner ones alternate with the stamens, plumose or denticulate-hispid; the hispidness directed either upward or downward. *Stamens* three; rarely two, six, or twelve. *Filaments* broad and flat. *Anthers* linear, exserted. *Style* one, bifid, rarely entire, dilated at the base. *Nut* crustaceous, ovate, obovate, or rotund, lenticular or subglobose; often attenuated at the base, crowned and subarticulated with the indurated, persistent base of the style, or (as in *R. laxa* and *R. macrostachya*) with the whole style indurated and persistent. *Seed* ovate or globose, not adhering to the pericarp.

* *Nut rugose.*

1. *R. cymosa* (Nutt.); culmo triquetro, corymbis subcymosis terminalibus axillaribusque, spiculis ovatis glomeratis, nuce orbiculato-obovata subcompressa transversim undulato-rugulosa setis sursum hispidulis longiori, tuberculo brevi conico.

R. cymosa. *Nutt. Gen. v.* 1. *p.* 33. *Rœm. et Schult. Mant. v. II. p.* 47. *Torrey, Fl. v.* 1. *p.* 56. (*excl. syn. Ell. et Pursh.*).—Schœnus cymosus, *Willd. Sp. Pl. v.* 1. *p.* 265. *Muhl. Gram. p.* 9.

Culm one to two feet high, smooth, acutely triangular. *Leaves* two to three lines wide, glabrous; the *radical* ones somewhat crowded, the upper *cauline* ones often overtopping the culm. *Sheaths* striate. *Corymbs* three to four, somewhat densely flowered; the terminal ones largest, the lateral ones on short, exserted peduncles. *Spikelets* aggregated in fives (three, *Willd.*) on the ultimate divisions of the corymbs. *Glumes* fuscous; the inferior ones suborbicular, emarginate, mucronate; the interior ones ovate. *Bristles* six, a little more than one half the length of the nut, slightly hispid upward. *Stamens* three. *Style* bifid. *Nut* a line long, compressed or somewhat tumid. *Tubercle* (the persistent base of the style) depressed-conic, about one quarter the length of the nut.

Hab. New Jersey to Louisiana. Maryland, Charleston, Georgia, and New Orleans. July to August.

Obs. The *R. cymosa* of Elliott is described as having a terete culm, and a smooth nut. His plant is most probably *Schœnus fascicularis.* Mx.

2. R. *Torreyana;* culmo gracili subtereti, foliis setaceis, paniculis corymbosis subsparsifloris, spiculis ovatis plerumque pedicellatis, nuce elliptico-obovata compressa transversim rugosa setis sursum hispidulis longiori, tuberculo compresso-conico basi latitudine nucis.

R. micrantha, *Gray, Gram. et Cyp. I. no.* 96. (*excl. syn.*)

Culms cæspitose, one to three feet high, striate, subterete, and, with the leaves, glabrous. *Radical leaves* six to eight inches long, narrow and rigid; *cauline* ones much shorter, setaceous. *Panicles* one to three, corymbose, somewhat loosely flowered, on short *peduncles. Spikelets* ovate, mostly pedicellate. *Glumes* fuscous, ovate, mucronate. *Bristles* six, hispid upwards, one-half to two-thirds the length of the nut. *Stamens* three. *Nut* exceeding a line in length, oblong-obovate, very evenly transversely rugose, with minute longitudinal striæ. *Tubercle* compressed-conic, very broad at the base, scarcely one-third as long as the nut.

Hab. New Jersey. July to August.

Obs. In its nut and bristles this species approaches *R. rariflora,* but is widely different in habit.

3. R. *rariflora* (Ell.); culmis cæspitosis foliisque setaceis, paniculis simplicibus paucifloris, spiculis ovatis, nuce obovata compressa transversim rugosa setis sursum hispidulis longiori, tuberculo compresso-conico.

R. rariflora, *Ell. Bot. S. Car. et Georg. v.* 1. *p.* 58. (*excl. syn.*)

Schœnus rariflorus, *Mx. Fl. v.* 1. *p.* 36. *et Herb.! Pers. Syn. v.* 1. *p.* 60. *Muhl. Gram. p.* 10.

Culms capillary, six to twelve inches high. *Leaves* setaceous, shorter than the culm. *Panicles* subcorymbose, nearly simple, very loosely and few- (three to eight) flowered. *Spikelets* ovate, all pedicelled. *Glumes* ovate, mucronate, fuscous. *Bristles* six, very fragile, so that the whole number is seldom seen when the fruit is mature; minutely hispid upward, variable in length, but always shorter than the nut. *Stamens* three. *Style* bifid. *Nut* obovate, deeply rugose, crowned with a compressed conic *tubercle,* scarcely half so long as the nut.

Hab. S. Carolina and Georgia, Louisiana.

Obs. This plant was erroneously referred by Vahl (*Enum. II. p.* 231.), to his *R. micrantha,* from the West Indies, a species nearly allied to ours, but which differs in the length of its bristles and tubercle. There is no specimen of *Schœnus rariflorus* in Muhlenberg's Herbarium.

4. R. *miliacea;* culmo triquetro folioso, paniculis axillaribus terminalibusque, ramis divergentibus laxe multifloris, spiculis turgido-ovatis omnibus pedicellatis, nuce globuloso-obovata transversim rugulosa setis sursum hispidulis ½ breviore, tuberculo brevissimo depresso-conico.

Schœnus miliaceus, *Lam. Ill. Gen. v.* 1. *p.* 137.—S. sparsus, *Mx. Fl. v.* 1. *p.* 35. *Muhl. Gram. p.* 7.—R. sparsa, *Vahl, Enum. v. II. p.* 230. *Pursh, Fl. v. I. p.* 48. *Rœm. et Sch. Syst. Veg. v. II. p.* 83, *Mant. v. II. p.* 45. *Elliott, Bot. S. Car. et Georg. v. I. p.* 62. *tab.* 2. *Torrey, Fl. v. I. p.* 56. *Spreng. Syst. Veget. v. I. p.* 195.

Whole plant smooth and somewhat glaucous. *Culm* two feet high, triangular, fistulose, very leafy below. *Lower leaves* linear-lanceolate, eight to sixteen inches long, three to four lines wide; the *upper* ones two to three inches in length, linear. *Panicles* corymbose, compound, diffuse, five to seven, on subexserted peduncles. *Spikelets* ovate, turgid, ("vix magnitudine seminis Milii," *Rœm. et Sch.*) borne on slender pedicels, half an inch long, each spikelet perfecting four to six nuts. *Glumes* fuscous, very caducous, ovate, carinate. *Bristles* six, about one-third longer than the nut, somewhat caducous, hispid upward. *Style* bifid. *Nut* about half a line long, tumidly obovate or ovate, crowned with a depressed-conic *tubercle*, scarcely one-fourth its length.

Hab. Wet soils, in pine barrens generally; N. Carolina, Georgia, and New Orleans.

Obs. This species is also a native of Puerto Rico, where it was collected by Bertero. I have adopted the specific name of Lamarck, on account of its priority.

5. *R. caduca* (Ell.); culmo triquetro, paniculis axillaribus terminalibusque erectis, spiculis ovatis, nuce orbiculato-ovata paululum plano-convexa transversim rugulosa basi subattenuata tuberculum excedente setis sursum hispidis subduplo breviore.

R. caduca, *Ell. Bot. S. Car. et Georg. v. I. p.* 62. *Rœm. et Schult. Mant. v. II. p.* 51. *Spreng. Syst. Veget. p.* 196.

Culm acutely triangular, one to two feet high. *Leaves* broadly linear, two to three lines wide, glabrous. *Panicles* corymbose, with the flowers somewhat crowded, on peduncles twice as long as the sheaths. *Spikelets* ovate, acute, nearly twice as large as in *R. cymosa*, pedicellate or sessile. *Glumes* caducous; exterior ones broadly ovate, carinate, with a short mucro; the interior ones longest, acute. *Bristles* six, twice the length of the nut, hispid upward. *Stamens* three. *Style* long, slightly bifid. *Nut* a line long, somewhat plano-convex, crowned with a compressed-conic tubercle, nearly one-third its length.

Hab. Wet soil, Charleston, S. Carolina, N. Carolina, and at St. John's, Florida.

Obs. "This species is nearly allied to *R. sparsa* (*R. miliacea, nob.*), from which it differs in having its spikelets larger, clustered, and its panicle rather appressed than diffused. It is also remarkable for the facility with which it drops its mature glumes, so that in a specimen where the seeds are perfect, many of them will be found naked, adhering to their pedicels." *Ell. l. c.* It is also closely allied to *R. cymosa*, but is readily distinguished from that species by its larger, often pedicellate spikelets, plano-convex fruit, and longer bristles.

6. *R. inexpansa* (Vahl); culmo subtriquetro debili, paniculis subsparsifloris ramulis approximato-erectis, spiculis fusiformibus, nuce oblonga compressa transversim rugosa setis sursum hispidis dimidio longiori, tuberculo nuce subtriplo breviore.

R. inexpansa, *Vahl, Enum. v. II. p.* 233. *Ell. Bot. S. Car. et Georg. v. I. p.* 61. *Rœm. et Sch. Syst. Veg. v. II. p.* 85. *Spreng. Syst. Veg. v. I. p.* 197.

Schœnus inexpansus, *Mx. Fl. v. I. p.* 35, *et Herb.! Muhl.! Gram. p.* 9.

Culm one and a half to two feet high, obscurely triangular, slender, somewhat nodding. *Leaves* narrow-linear, smooth, and short; *cauline* ones rather remote, as long as the internodes. *Panicles* two to four, on filiform subpendulous peduncles. *Spikelets* fusiform, subfasciculate. *Glumes* fuscous, ovate, acute. *Bristles* six, twice as long as the nut, hispid upward. *Stamens* three. *Style* long, deeply bifid. *Nut* oblong, compressed, evenly rugose. *Tubercle* compressed, acute, with the base about the width of the summit of the nut.

Hab. Charleston, S. Carolina, Georgia, and near New Orleans.

7. *R. multiflora;* culmo triquetro, basi folioso, paniculis axillaribus terminalibusque, ramis subapproximatis laxifloris, spiculis ovatis, nuce obovata compressa valde rugosa setis sursum hispidis duplo breviore.

Scirpus schœnoides, *Ell. Bot. S. Car. et Georg. v. I. p.* 89.

Culm about three feet high, triangular, leafy, especially towards the base. *Leaves* somewhat coriaceous, glabrous, two lines wide; the lower ones eight to ten inches in length; the upper ones much shorter, and somewhat distant. *Panicles* four to five, on subexsert *peduncles;* the terminal one largest. *Branches* of the panicle subapproximate, filiform; the lower ones nearly two inches in length, with a scabrous, setaceous *bract* at the base of each. *Spikelets* ovate, small, rather loosely disposed upon the ramuli, on short pedicels, or glomerate in twos and threes. *Glumes* fuscous, broadly ovate, carinate, with a very short mucro. *Bristles* six, twice as long as the nut, strongly hispid upward. *Style* long, cleft almost to the base. *Nut* a little exceeding half a line in length, obovate, much compressed, deeply transversely rugose, crowned with a compressed conic tubercle, nearly one-third its length.

Hab. New Orleans, St. Mary's, Florida, Georgia.

Obs. This very distinct species somewhat resembles *R. caduca;* from which, however, it may be readily distinguished by its much more numerous and smaller spikelets, its strongly hispid bristles, and its much compressed and deeply rugose nut. The Herbarium of Dr. Baldwin contains specimens of this plant, with *R. inexpansa* and *R. patula,* under the name of *R. pendula.* In his detailed description, in manuscript, he has very strangely confounded these three species; but the plant here described is doubtless the one which he transmitted under this name to Elliott; for a specimen of *Scirpus schœnoides,* from the latter gentleman, in the Herbarium of Dr. Torrey, agrees in all respects with our plant. I see no reason for referring this plant to the genus *Scirpus.*

8. *R. patula;* culmo triquetro superne gracili, corymbis axillaribus terminalibusque patulis laxifloris, spiculis ovatis, nuce orbiculata (vel orbiculato-obovata) compressa transversim rugosa setis sursum hispidis breviore.

Culm about two feet high, thick and strong at the base, slender above. *Leaves* linear, shorter than the culm; cauline ones very short, narrow-linear, flat. *Corymbs* three to five (the terminal one largest), exsertly pedunculate, compound or decompound, many-flowered, diffusely patulous. *Bracts* setaceous, shorter than the corymbs, smooth or somewhat scabrous on the margins. *Spikelets* ovate, about as large as in the preceding species. *Glumes* ovate, mostly mucronate. *Bristles* six, less strongly hispid than in *R. multiflora,* somewhat exceeding the nut. *Stamens* three. *Style* bifid. *Nut* about half a line in length, nearly orbicular, compressed, transversely rugose, with minute longitudinal striæ. *Tubercle* compressed-conic, dilated at the base, nearly half as long as the nut.

Hab. Florida. In moist land and near streams, Savannah, Georgia; also in East Florida. Flowers from June to July.

Obs. This species is very nearly allied to the preceding, with which it is confounded in the Herbarium of Dr. Baldwin. It is sufficiently distinguished, however, by its nearly orbicular and less deeply rugose nut, its shorter bristles, and patulous corymbs.

9. *R. microcarpa* (Baldw.); culmo gracili subtrigono, corymbis sparsifloris exserte pedunculatis plerumque approximatis, setis fragilibus sursum hispidulis nucem minimam ovatam compressam rugosam subæquantibus.

R. microcarpa, *Baldwin, MSS. et Herb.!*

Cæspitose. *Culm* slender, obscurely triangular. *Radical leaves* narrow-linear, subcoriaceous, four to six inches long, and about two lines wide. *Cauline leaves* few, very narrow, flat, with setaceous tips. *Corymbs* four to five, exsertly peduncled, and

rather loosely flowered; the three upper ones approximate at the summit of the culm, the lower ones subremote. *Spikelets* turgidly ovate, about a line in length. *Glumes* dark-fuscous. *Bristles* six? very fragile, scarcely equalling the nut, minutely hispid upward. *Stamens* three. *Nut* less than half a line long, ovate, flattened, transversely rugose, with minute longitudinal striæ. *Tubercle* very short, compressed.

HAB. In wet savannahs. Flowers from June to July. St. Mary's, Florida; Wilmington, N. Carolina.

OBS. The bristles in this species, on account of their extreme fragility, are seldom found entire when the fruit is mature.

10. *R. plumosa* (Ell.); culmo triquetro foliisque setaceis, glomerulis paucifloris ad summitatem culmi subcongestis, bracteis aristatis, nuce globuloso-obovata transversim rugosa setas plumosas æquante, tuberculo brevissimo.

R. plumosa, *Ell.! Bot. S. Car. et Georg. v. I. p.* 58. *Ræm. et Sch. Mant. v. II. p.* 50. *Spreng. Syst. Veget. v. I. p.* 195.

Schœnus ciliaris, *Muhl. Gram. p.* 11.

Culm eight to twelve inches high, triangular, smooth. *Leaves* setaceous, and somewhat rigid, shorter than the culm. *Flowers* in small fascicles, forming a loose cylindrical *spike*, sometimes furnished with a subremote, pedunculate, axillary spike. *Bracts* setaceous; the lower ones an inch or more in length. *Glumes* fuscous, broadly ovate; the outer ones mucronate. *Bristles* six, plumose, as long as the nut. *Nut* globosely obovate or ovate, about a line in length. *Tubercle* short, depressed-conic, apiculate.

HAB. Dry Pine-barrens. Flowers from June to August. Charleston, S. Carolina; Florida; Georgia; Fayetteville, and Wilmington, N. Carolina.

11. *R. punctata* (Ell.); paniculis corymboso-fasciculatis exserte pedunculatis, nuce obovato-compressa reticulato-rugulosa alveolis impressis setis sursum hispidulis paulo breviore, tuberculo compresso-conico.

R. punctata, *Ell. Bot. of S. Car. et Georg. v. I. p.* 60. *Ræm. et Sch. Mant. v. II. p.* 51. *Spreng. Syst. Veg. v. I. p.* 196. (*excl. syn.*)

Culm slender, triangular, one to two feet high. *Radical leaves* not seen; cauline ones one to two inches long, linear-lanceolate, acute. *Corymbs* three to four, lateral and terminal, fascicled; the lateral ones subsimple, distant, and long-peduncled. *Fascicles* subtended by short, setaceous, and rigid bracts. *Spikelets* ovate. *Glumes* chestnut-coloured, ovate, the lower ones mucronate. *Bristles* six, a little exceeding the nut, slightly hispid upward. *Stamens* three. *Nut* ovate, compressed, reticulately rugose, with impressed alveoli. *Tubercle* compressed-conic, shorter than the nut.

HAB. Savannah, Georgia; St. Mary's, Florida. Flowers from May to June.

OBS. In the specimens collected in Florida by the late Dr. Baldwin, the discoverer of this species, the lateral corymbs are distant, and not clustered together at the summit of the culm. Except in this unimportant variation, the plant I have described agrees in every respect with the detailed description of Elliott, who also obtained his specimens from Dr. Baldwin.

12. *R. Elliottii*; culmo triquetro, corymbis fasciculatis paucifloris, spiculis ovato-oblongis, nuce subgloboso-ovata lævissime rugulosa setis sursum hispidis paulo breviore, tuberculo brevi depresso-conico.

R. distans, *Ell. Bot. of S. Car. et Georg. v. I. p.* 59. (*excl. syn.*) *non Vahl.*

Schœnus distans, *Muhl. Gram. p.* 10.

S. fuscus, *Muhl. Gram. p.* 6.

Culm one to two feet high, rather slender, exactly triquetrous. *Leaves* narrow-linear, flat, glabrous. *Corymbs* three to four, terminal and lateral, exsertly pedunculate, subsimple and few-flowered. *Spikelets* fasciculate, sessile, ovate or oblong-ovate. *Glumes* light chestnut-coloured, ovate; the interior ones mucronate. *Bristles* six, hispid upwards, fuscous, a little longer than the nut, but scarcely exceeding the tubercle. *Stamens* three to six. *Style* very long, deeply bifid. *Nut* brownish red, subglobosely ovate, a little atte-

nuate at the base, and slightly produced at the summit; under a lens appearing minutely transversely rugose, but to the naked eye nearly smooth. *Tubercle* very short, depressed-conic.

HAB. Damp Savannahs, Wilmington, N. Carolina; Havanna, Georgia, and New Smyrna, Florida.

OBS. This species, which is well described by the distinguished Botanist whose name it bears, differs widely from *Schœnus distans* of Mx. It is compared by Elliott with his *R. punctata,* which indeed it somewhat resembles, but the two species cannot be confounded. The light chestnut-coloured spikelets in this species are quite remarkable. There is a specimen of this plant in Muhlenberg's Herbarium, labelled *Schœnus fuscus,* Ell., and from this specimen the detailed description of *S. fuscus, Muhl. Gram.* was probably drawn up, as it agrees quite well with this species, and not at all with *S. fuscus, Linn.* There is no specimen under the name of *S. distans* in Muhlenberg's Herbarium; but as he asks whether his *S. fuscus* may not be *S. distans, Mx.*, and as he probably drew his description from specimens, sent either by Elliott or Dr. Baldwin, I cannot doubt that the synonym is properly referred.

** *Nut not rugose.*

13. *R. corniculata;* corymbis decompositis diffusis, spiculis (magnis) laxe fasciculatis, nuce obovata lævi stylo persistente multo breviore setis subulatis inæqualibus sursum hispidulis longiore.

Schœnus corniculatus, *Lam. Ill. Gen. v. I. p.* 137.—S. longirostris, *Mx. Fl. v. I. p.* 87. *Muhl.! Gram. p.* 7.—S. umbellatus, *Walt. Fl. Car. p.* 70.?

R. laxa, *Vahl, Enum. v. II. p.* 231. *Pursh, Fl. v. I. p.* 48. *Rœm. et Sch. Syst. Veg. v. II. p.* 84. *Torrey! Fl. v. I. p.* 57. *Spreng. Syst. Veget. v. I. p.* 196.—R. longirostris, *Ell. Bot. S. Car. et Georg. v. I. p.* 59.

Whole plant smooth and somewhat glaucous. *Culm* triquetrous, three to six feet high. *Leaves* a foot or more in length, a quarter to half an inch wide, smooth, scabrous on the margin. *Flowers* axillary and terminal, in decompound, subumbellate corymbs; the terminal one largest. *Spikelets* subulated by the persistent exserted *styles;* when mature, nearly an inch in length, loosely fascicled in fours and fives at the extremity of the elongated, triquetrous peduncles. *Glumes* ovate, fuscous. *Bristles* for the most part six, subulate, minutely scabrous upward; the three outer ones (one of which is frequently wanting) about one-fourth the length of the nut; one of the minor series about half, the two others one-third the length of the nut. *Stamens* three. *Style* undivided. *Nut* smooth, obovate, compressed, crowned with the scabrous (upward) persistent, indurated *style,* about twice and a half its length.

HAB. Ohio to Louisiana, common. Delaware.

OBS. I have restored the specific name of Lamarck on account of its priority.

14. *R. macrostachya* (Torr. Herb.); corymbis axillaribus simplicibus terminalibus compositis, spiculis magnis confertim fasciculatis, nuce obovata lævi setis sursum hispidulis duplo—stylo persistente subquadruplo—breviore.

Culm two feet high, smooth, triangular. *Leaves* glabrous, one to two feet long, and two to four lines broad; the upper ones scabrous on the margin. *Corymbs* about four, densely fasciculated; the lateral ones subsimple, on peduncles twice the length of the sheaths; the terminal one largest, compound, subsessile, leafy; the fascicles sessile and pedunculate. *Glumes* fuscous, scarious, acute; the outer ones ovate; the inner ones ovate-lanceolate. *Bristles* six, filiform, minutely hispid upward, about twice as long as the nut; the exterior ones somewhat shortest. *Stamens* three. *Style* undivided, the whole indurated and persistent, hispidly scabrous upward; when mature, nearly four times as long as the obovate, compressed *nut.*

HAB. Near Amherst, Massachusetts; New Bedford.

OBS. This species, and the preceding, to which it is closely allied, differ in habit from the other N. American *Rhynchosporæ;*

they also have simple and entirely persistent styles, and might perhaps be referred to the genus *Cephaloschœnus*[1] of Nees von Esenbeck.

15. *R. dodecandra* (Baldwin); paniculis corymbosis laxiusculis, spiculis ovato-lanceolatis, staminibus duodenis, nuce oblonga lævi tuberculum subhemisphæricum longe excedente, setis sursum hispidulis nucem æquantibus.

R. dodecandra, *Baldw. MSS. et Herb.*

Culm triquetrous, two feet or more high. *Radical leaves* not seen. *Cauline leaves* equalling the culm, rigid, and subcoriaceous, three to four lines wide, smooth, a little scabrous on the margin. *Panicles* five to six, lateral and terminal, on peduncles twice the length of the sheaths, corymbose, loosely flowered; the lateral ones simple, the terminal one compound, or with two or three clustered together at the summit of the culm. *Spikelets* ovate-lanceolate, sessile and pedicellate. *Glumes* chestnut-coloured. *Bristles* six, equalling the nut, minutely hispid upward. *Stamens* ten to twelve. *Anthers* long-linear, orange-red. *Style* bifid. *Nut* (immature) oblong, somewhat attenuated downwards, smooth or slightly corrugated longitudinally. *Tubercle* short, hemisphærical, somewhat compressed, as wide as the summit of the nut.

HAB. "Near the sea-shore. Fort George Island, E. Florida, April, 1817." *Dr. Baldwin.*

OBS. The habit of this remarkable species is very similar to that of *R. corniculata* in a young state. Dr. Baldwin remarks of the present, that its bristles equal the stamens in number. I have seen only six in the specimens I have examined.

16. *R. megalocarpa;* hexandra, corymbis sparsifloris, nuce ovata lenticulari lævi nigrescente, tuberculo obtuse conico confluente, setis caducis sursum hispidulis nucem subæquantibus.

Schœnus macrocarpus, *Baldw. MSS. et Herb.!*

Culm glabrous, somewhat triangular, four feet high. *Leaves* rigid and coriaceous, pungently acute, carinate, smooth: *radical leaves* numerous, one to two feet long, three to five lines wide; *cauline* ones few and short. *Corymbs* axillary and terminal, exsertly pedunculate, few and loosely flowered. *Spikelets* about one-third of an inch long, ovate, tumid, sessile or on short pedicels. *Glumes* obtuse, the inner ones mucronate. *Bristles* six, caducous, minutely scabrous upward, equalling the nut. *Stamens* six. *Nut* (including the tubercle) two to three lines long, smooth and shining, becoming black with age, round-ovate, and strongly convex on both sides. *Tubercle* turgidly conic, much shorter than the nut, with which it appears confluent.

HAB. Fort George, E. Florida.

OBS. The bristles in this species are so exceedingly caducous that they escaped the notice of Dr. Baldwin, who referred the plant to the genus *Schœnus*. He remarks, however, that it only differs from *Rhynchospora* in wanting the bristles.

17. *R pycnocarpa;* corymbis sparsifloris, spiculis turgido-ovatis, nuce lævi ovata tumida vertice crasso tuberculo acutiusculo brevissime conico ampliore setis denis caducis sursum hispidulis nucem subæquantibus.

Culm triangular, two to three feet high. *Leaves* rigid, broad-linear, carinate, pungently acute; the lower ones elongated, three to four lines broad; the upper ones narrower, short. *Corymbs* terminal and lateral, somewhat distant, few and loosely flowered. *Spikelets* ovate, turgid, three to four lines in length. *Glumes* ovate, acute or mucronate. *Bristles* ten, equalling the nut, or a little shorter, minutely hispid upward, somewhat caducous. *Stamens* three. *Style* slender, deeply bifid. *Nut* rufous, smooth, and shining, slightly attenuated and compressed at the base, tumid above, with the summit somewhat thickened, and wider than the depressed, conic, very short tubercle.

[1] "CEPHALOSCHŒNUS. *Spiculæ* hermaphroditæ. *Stylus* simplex. *Perigynium* setosum, setis antrorsum denticulatis aut hirsutis. *Caryopsis* styli basi persistente discretaque rostrata." *Nees, Cyp. Indicæ, l. c.* 71.

HAB. Dry sandy Barrens, Wilmington, N. Carolina; Georgia; West Florida.

OBS. This species is very like the preceding in habit and general appearance.

18. *R. ciliata* (Vahl); foliis obtusis bracteisque ciliatis, spiculis ovatis corymboso-fasciculatis terminalibus, nuce lævi orbiculato-ovata lenticulari setis sursum hispidulis triplo longiori.

R. ciliata, *Vahl, Enum. v. II. p.* 238. *Pursh, Fl. v.* 1. *p.* 49. *Ræm. et Sch. Syst. Veget. v. II. p.* 87. *Spreng. Syst. Veget. v. I. p.* 196.

Schœnus ciliaris, *Mx. Fl. v. I. p.* 36. *et Herb.!*

Culm, leaves, and sheaths beautifully striate, and somewhat glaucous. *Culm* one to two feet and a half high, obscurely triangular. *Leaves* broad-linear, obtuse; radical ones four to six inches long, and two to three lines wide; cauline ones few and short. *Flowers* in a crowded, terminal corymb, sometimes with a much smaller, pedunculate, lateral fascicle. *Bracts* somewhat exceeding the corymb. *Glumes* ovate, carinate, mucronate, pubescent on the back above the middle. *Bristles* six, very short, minutely hispid upward. *Stamens* three. *Nut* nearly orbicular, lenticular, minutely alveolate under a powerful lens. *Tubercle* about one-third as long as the nut, broad at the base, compressed.

HAB. St. Mary's and St. John's, Florida; New Orleans; Georgia; Wilmington, N. Carolina.

19. *R. Baldwinii;* foliis acutis glaucis, spiculis ovatis corymboso-fasciculatis terminalibus, nuce lævi (ovata vel suborbiculato-ovata) lenticulari, setis duodenis sursum hispidulis nucem æquantibus.

R. glauca, *Baldw. MSS. et Herb.!*

HAB. "Georgia, in Pine Barren swamps, between the Satilla and Altamaha Rivers, Dec. 1816." *Dr. Baldwin.*

OBS. This species is very similar in habit to the preceding; but differs in having acute, not ciliate leaves, a larger nut, and longer bristles. *R. ciliata* also has six bristles, the ordinary number for this genus: this species has uniformly twelve. *R. glauca*, of Vahl, a native of Equinoctial America, has a rugose nut, and is doubtless distinct from our plant. I have therefore dedicated this species to the memory of its enterprizing discoverer, who paid much attention to the genus *Rhynchospora.*

20. *R. fascicularis* (Nutt.); culmo subtrigono, spiculis oblongis corymboso-fasciculatis pauciusculis terminalibus lateralibusque, nuce lævi ovata lenticulari setis sursum hispidulis duplo longiori, tuberculo compresso nuce breviore.

R. fascicularis, *Nutt. Gen. v. I. p.* 33. *Vahl, Enum. v. II. p.* 334.? *Pursh, Fl. v. I. p.* 48.

R. cymosa, *Elliott, Bot. S. Car. et Georgia, v. I. p.* 58?—Schœnus fascicularis? *Mx. Fl. v. I. p.* 37. *et Herb.! Pers. Syn. v. I. p.* 60.

Culm eighteen inches to two feet high, obscurely triangular. *Leaves* narrow-linear, shorter than the culm. *Corymbs* about three, densely fascicled and somewhat few-flowered; the lower one subdistant, exsertly pedunculate; the two upper approximate, subsessile. *Pedicels* very short. *Bracts* setaceous. *Spikelets* oblong. *Glumes* ovate, carinate, with a long mucro; the exterior shorter, obtuse; the inner ones acute. *Bristles* six, about half as long as the nut, minutely hispid upward. *Stamens* three. *Style* bifid. *Nut* lenticular, ovate or round-ovate, smooth. *Tubercle* much compressed, with the base as broad as the nut, about half its length.

HAB. Carolina; Georgia; New Orleans.

OBS. The spikelets, nut, and bristles of our plant agree in every respect with a fragment of *Schœnus fascicularis* from Mx.'s Herb. The description in his *Fl. Bor. Amer.* applies minutely to our specimens, excepting the paragraph "*setulis semine lævi duplo longioribus;*" whereas, in his own plant, and in all the specimens I have examined, the reverse is true, the nut being about twice the length of the bristles. Elliott, who copies the description of Michaux, remarks that the plant has

not fallen under his observation. I suspect that he has mistaken it for *R. cymosa.* I have not the means of determining whether our plant is the *R. fascicularis* of Vahl; it certainly does not agree, in some respects, with the detailed description of that species in *Rœm. et Sch. Syst. Veget.* There is no specimen under the name of *Schœnus fascicularis* in the Muhlenbergian Herbarium.

21. *R. paniculata;* culmo triquetro, paniculis numerosis approximatis interdum geminatis, spiculis oblongo-lanceolatis ad ramulos fasciculatis, nuce lævi obovata lenticulari tuberculum subulatum æquante, setis retrorsum hispidis nucem plus duplo longioribus.

Culm triangular, three to four feet high. *Leaves* linear, smooth, somewhat scabrous on the margin and keel. *Panicles* numerous, approximate, so as to appear like a single elongated, compound panicle; often two or more from the same sheath. *Peduncles* compressed, scabrous, nearly erect, much longer than the sheaths; the lower ones longest. *Bracts* filiform-setaceous, with scabrous margins, equalling the panicles. *Flowers* in small fascicles, crowded on the ultimate divisions of the panicles. *Spikelets* ovato-lanceolate. *Glumes* lanceolate, rather obtuse, with a short mucro. *Bristles* six, conspicuously retrorsely hispid, more than twice the length of the nut. *Stamens* three. *Style* slightly bifid. *Nut* smooth, obovate, lenticular, broad at the summit, subattenuate at the base. *Tubercle* subulate, compressed, as long as the nut.

HAB. New Orleans.

22. *R. oligantha;* culmo subaphyllo filiformi, spiculis paucissimis ovato-oblongis, setis sursum hispidis infra medium plumosis nucem oblongiuscule obovatum (minutissime exasperatum) paulo superantibus, tuberculo brevissimo conico.

Culm filiform, six to twelve inches high, nearly leafless. *Spikelets* one to four, two to four lines long, solitary or in twos and threes on a slender, scabrous peduncle, surmounted by a single filiform bract, which appears like a continuation of the culm; sometimes there is a single, remote, long-pedunculate, lateral spikelet. *Glumes* broad-ovate, acute. *Florets* raised on a naked articulated stipe, about a line in length. *Bristles* six, as long as the nut and tubercle, hispid upward, plumose below the middle. *Stamens* three. *Style* bifid. *Nut* to the naked eye nearly smooth (minutely rough under a powerful lens) obovato-oblong, subterete with a very short acumination supporting a conic tubercle, scarcely one-fourth the length of the nut.

HAB. Fayetteville, and near Wilmington, N. Carolina.

23. *R. semiplumosa;* culmo subtereti, foliis bracteisque setaceis, spicis approximatis ad summitatem culmi, setis sursum hispidis infra medium plumosis nucem ovatam lævem paulo superantibus, tuberculo compresso-conico nucem subæquante.

Culm a foot high, subterete, striate, smooth. *Leaves* setaceous, shorter than the culm, scabrous on the margin. *Bracts* setaceous, surpassing the culm. *Spikes* three, oblong, densely flowered, approximate, nearly sessile. *Spikelets* small, ovate. *Glumes* ovate, acute. *Bristles* six, a little exceeding the nut, hispid upward, plumose below the middle. *Stamens* three. *Filaments* very broad. *Style* deeply bifid. *Nut* ovate, compressed, smooth or with a very minute, deciduous pubescence. *Tubercle* compressed-conic, acute, minutely hispid, nearly as long as the nut.

HAB. New Orleans.

OBS. This species is nearly allied to *R. plumosa*, but is well characterized by its bristles which are only plumose below the middle, its smooth nut, and long flattened tubercle. I regret, however, having seen no specimens in which the fruit is fully mature.

24. *R. alba* (Vahl); culmo superne triquetro, spiculis corymboso-fasciculatis, setis denis retrorsum hispidis nuce lævi lenticulari basi subattenuata longioribus.

R. alba, *Vahl, Enum. v. II. p.* 236. *Pursh, Fl. v.* 1. *p.* 49. *Elliott, Bot. S. Car. et Georg. v.* 1. *p.* 57. *Rœm. et Sch. Syst. Veg. v. II. p.* 87. *Torrey, Fl. v.* 1. *p.* 54. *Gray, Gram. et Cyp. v.* 1. *n.* 92.—Schœ-

nus albus, *Linn. Sp. Pl. p.* 65. *Mx. Fl. v.* 1. *p.* 5. *Bigel, Fl. Bost. p.* 17.

Culm slender, twelve to eighteen inches high, glabrous. *Leaves* setaceous, shorter than the culm. *Flowers* in close, corymbose clusters, terminal and axillary, with short setaceous bracts at the base. *Spikelets* lanceolate. *Glumes* ovate, acute, white, becoming brownish with age. *Bristles* ten, retrorsely hispid, nearly one-half the length of the nut (equalling the nut with the tubercle. *Stamens* 2 (3, 2, and 1, *Muhl.*). *Style* bifid. *Nut* lenticular, ovate, somewhat attenuate at the base, when young, triquetrous, elevated on a short stipe, upon which the bristles are inserted. *Tubercle* compressed, one-half the length of the nut.

Hab. In sphagnous swamps, common; Canada to Carolina. Flowers from July to September.

Obs. The N. American plant agrees in every respect with specimens from the North of Europe.

25. *R. capillacea* (Torrey); culmo trigono gracili, spiculis 3—6 plerumque terminalibus, nuce lævi oblongo-ovata stipitata setis retrorsum hispidis dimidio—tuberculo duplo-longiori.

R. capillacea, *Torrey ! Fl. v.* 1. *p.* 55. *Gray, Gram. et Cyp. v.* 1. *n.* 95.—Schœnus setaceus, *Muhl. ! Gram. p.* 6.

Culm six to twelve inches high, very slender, smooth. *Leaves* setaceous, nearly flat, radical ones short. *Spikelets* oblong, mostly terminal, with a setaceous bract at the base of each. *Glumes* chestnut-coloured, with scariose margins, oblong-ovate, carinate, mucronate. *Bristles* six, large, retrorsely hispid, about twice the length of the nut. *Stamens* three. *Style* bifid. *Nut* oblong-ovate, somewhat lenticular, attenuate at the base, triquetrous when young, raised on a short stipe, which bears the bristles. *Tubercle* compressed, acute, about half as long as the nut.

Hab. Swamps, Pennsylvania; Penn-Yan, and on limestone rocks, Watertown, New York.

26. *R. fusca* (Rœm. et Sch.); foliis setaceis canaliculato-carinatis, spiculis ovato-oblongis, nuce lævi obovata subtumida basi paula attenuata setis sursum hispidulis duplo breviore, tuberculo compresso margine serrulato-scabro.

R. fusca, *Rœm. et Sch. Syst. Veg. v. II. p.* 81. *Spreng. Syst. Veg. v. I. p.* 194.

R. alba, *var.* fusca, *Vahl, Enum. v. II. p.* 236.—Schœnus fuscus, *Linn. Sp. Pl. p.* 1664. *Wahl. Fl. Suec. v.* 1. *p.* 23.

Culm six to twelve inches high, slender, triquetrous. *Leaves* setaceous, channelled; radical ones elongated; cauline ones very short. *Fascicles* one to three, few-flowered; the uppermost approximate, on short included peduncles; the lowest remote, exsertly pedunculate. *Spikelets* ovate, oblong, acute. *Glumes* mucronate, dark, fuscous, and shining. *Bristles* six, very slender, hispid upward, about twice the length of the nut; three alternate ones somewhat shortest, or scarcely exceeding the nut. *Stamens* three. *Nut* smooth, but with its surface often slightly irregular, obovate, subattenuate at the base, lenticular, somewhat tumid. *Tubercle* much compressed, broad at the base, serrulate on the margin, attenuate into the style, which is sometimes almost wholly persistent.

Hab. Pine Barrens of New Jersey; Boston.

Obs. Our plant agrees in every respect with a Swedish specimen of *R. fusca*, except that in the foreign plant the nut is somewhat uneven, and a little more tumid than in ours. I am, however, satisfied of their identity. This species is quite distinct from *R. alba*, of which some European Botanists have considered it a *var.* It is much more nearly related to *R. capillacea*, from which it is well distinguished by the form of the nut, the upward direction of the hispidness of the bristles, and the serrulate tubercle. In this species the glumes are dark-fuscous; in *R. capillacea* they are light-fuscous, or chestnut-coloured. *R. fusca* has carinate and channelled leaves; in *R. capillacea* they are nearly flat. *R. fusca* is said by Sprengel, Rœm. and Sch., to have but three bristles; there are six, in all the specimens, both Euro-

pean and American, that I have examined; a specimen from N. Carolina, collected by Mr. Curtis, appears to differ from this species only by its smaller spikelets, but is too imperfect to be positively determined.

27. *R. gracilenta;* culmis foliisque gracillimis, corymbis minimis subconfertis terminali subsessili lateralibus exserte pedunculatis, nuce lævi ovata (vel orbiculari-ovata) lenticulari setis sursum hispidulis breviore, tuberculo subulato basi dilatato nucem subæquante.

R. fusca, *Gray, Gram. et Cyp. v. I. n.* 93. (*excl. syn.*)

Culm slender, sometimes almost capillary, one to two feet high, obscurely triangular. *Leaves* linear-setaceous, four to twelve inches long. *Fascicles* two to four (often with a solitary terminal fascicle or subcapitate corymb) lateral and terminal, small, few-flowered; the uppermost subsessile, the lower ones exsertly and often filiformly pedunculate. *Spikelets* ovate. *Glumes* ovate, acute, or mucronate, fuscous. *Bristles* six, about half as long again as the nut, minutely hispid upward. *Stamens* three. *Nut* ovate, or round-ovate, smooth. *Tubercle* subulate, dilated at the base, compressed.

HAB. Pine Barrens of New Jersey. August to September. New York; N. Carolina.

OBS. This plant is proposed as a new species with some hesitation. It is possibly *R. distans* of Vahl, but is quite different from *Schœnus distans,* Mx. It does not disagree with the specific character of *S. axillaris,* Lam. Ill. Gen. v. I. p. 137; but the character of that species is so brief and general that it applies equally well to several other species.

28. *R. distans* (Nutt.); corymbis fasciculatis lateralibus subdistantibus, spiculis subconfertis ovatis, nuce lævi ovata lenticulari tuberculo brevi apiculata setas sursum hispidulas subæquante.

R. distans, *Nutt. Gen. v. I. p.* 33, *non Vahl! nec Elliott.*—Schœnus distans, *Mx. Fl. v. I. p.* 36. *et Herb.! Pers. Syn. v. I. p.* 60.

Culm rather slender, one to two feet high, obtusely trigonous. *Leaves* narrow-linear, flat; the lower ones four to six inches long; the upper ones shorter. *Corymbs* fascicled; the (two or three) upper ones aggregated at the summit of the culm; the lateral ones (one or two) distant, on short exserted peduncles. *Spikelets* ovate. *Glumes* fuscous, broad-ovate, mucronate. *Bristles* six, minutely hispid upward, about as long as the nut. *Nut* smooth, broad-ovate, lenticular. *Tubercle* compressed-conic, a little dilated at the base, one-third the length of the nut.

HAB. Carolina.

β. fasciculis laxiusculis, setis nucem excedentibus.—R. tenuis, *Baldw. MSS. et Herb.*

Culm somewhat acutely triangular. *Corymbs* rather loosely fasciculate, the lower ones long-pedunculate. *Bristles* nearly twice the length of the nut. *Tubercle* not dilated at the base.

HAB. Savannah, Georgia.

OBS. The synonyms of Vahl and Pursh are omitted, as it is impossible to determine the plant to which they belong. They may be referred with about an equal chance of correctness to *R. glomerata, R. gracilenta,* and the present species. *Var. β,* although differing in the above-mentioned particulars, and uniformly having bristles longer than the nut, is not, as I think, specifically distinct.

29. *R. glomerata* (Vahl); corymbis fasciculato-glomeratis vel subspicatis axillaribus terminalibusque interdum geminatis, spiculis ovato-oblongis, nuce lævi obovata lenticulari basi attenuata quasi stipitata tuberculum subulatum æquante, setis retrorsum hispidis nuce duplo longioribus.

R. glomerata, *Vahl, Enum. v. II. p.* 234. *Pursh, Fl. v. I. p.* 48. *Rœm. et Sch. Syst. Veg. v. II. p.* 86. *Elliott, Bot. S. Car. et Georg. v. I. p.* 61. *Torrey, Fl. v. I. p.* 55.—R. capitellata, *Vahl, Enum v. II. p.* 235. *Rœm. et Sch. Syst. Veg. v. II. p.* 87. *Elliott, Bot. S. Car. et Georg. v. I. p.* 61.—Schœnus glomeratus, *Linn. Sp. Pl. p.* 65. *Willd. Sp. Pl. v. I. p.* 236. *Muhl.! Gram. p.* 8. *Walt. Fl. Carol. p.*

69.—S. capitellatus, *Mx. Fl. v. I. p.* 36.—S. capitulus, *Pers. Syn. v. I. p.* 60. *Muhl.! Gram. p.* 10?

Culm one to two feet high, triangular. *Leaves* narrow-linear, carinate, smooth, scabrous on the margin, shorter than the culm. *Flowers* in corymbose or capitate fascicles, on included or somewhat exserted peduncles, lateral and terminal, often two or more from the same sheath; the lower ones distant. *Spikelets* ovate-oblong or lanceolate. *Glumes* brownish, lanceolate, mucronate. *Bristles* six, retrorsely hispid, twice as long as the nut. *Stamens* three. *Nut* smooth, obovate, lenticular, attenuate at the base. *Tubercle* subulate, compressed, equalling the nut.

Hab. Swamps, Canada to Florida. Flowers from July to September.

30. *R. cephalantha;* capitulis axillaribus terminalibusque subglobosis multifloris interdum geminatis, spiculis oblongo-lanceolatis, nuce lævi orbiculato-obovata lenticulari submarginata basi attenuata tuberculum subulatum æquante, setis sursum vel retrorsum hispidis nuce duplo longioribus.

Culm thick, triangular, two to three feet high. *Leaves* narrow-linear, flat, subcarinate, lower ones elongated; the upper ones much shorter. *Capituli* two to seven, large, subglobose, remote, on included or slightly exserted peduncles, often two or more from the same sheath. *Spikelets* oblong-lanceolate. *Glumes* fuscous, ovato-oblong, acute. *Bristles* six, about twice as long as the nut, hispid upward or downward. *Stamens* three. *Style* bifid. *Nut* larger than in *R. glomerata;* when mature, appearing as if surrounded with a thickened margin, smooth, obovate, very broad at the summit, attenuate at the base as if raised on a short stipe. *Tubercle* subulate, compressed, as long as the nut.

Hab. Pine Barrens of New Jersey, and on Long Island, about Babylon; Wilmington, N. Carolina; Georgia; New Orleans.

Obs. This interesting species was discovered by Professor Torrey, several years since, in the Pine Barrens of New Jersey and on Long Island, and as in these localities it mostly occurs with only two heads, it received the name of *R. biceps.* Our plants from the Southern States have uniformly more than two heads, and often six or seven. I have therefore substituted for the manuscript name of Dr. Torrey, one which is, in a great degree, characteristic of the habit of the species. This is very closely allied to *R. glomerata*, but is much larger and stronger in all its parts; its larger and margined nut; and its ample, and, for the most part, spherical heads, sufficiently distinguishing it. A most remarkable, and, I believe, peculiar character in this species, is, the diversity in the direction of the hispidness of the bristles; even in different individuals from the same cluster, the bristles being hispid both upward and downward. With this single exception, the direction of the hispidness of the bristles, is, in each species of the genus, perfectly constant.

ON THE ESCULENT PLANTS OF VAN DIEMEN'S LAND.

It is delightful to mark the rapid progress of Civilization and Science in this remote region of the globe, so recently occupied only by unfriendly savages. We have lately received from our friend, Ronald Gunn, Esq., the Van Diemen Almanack for 1834, and that for 1835, where we have the pleasure to find, among much useful miscellaneous matter, such as would have put to shame the almanacks of our own country a very few years back, two botanical communications, the first, entitled "*Some Remarks on the Roots and other indigenous Esculents of Van Diemen's Land,*" by James Backhouse, Esq. (but printed anonymously):—the second, called "*Index Plantarum,*" or an attempt towards a popular description of some of the most common and remarkable indigenous plants of Van Diemen's Land. This is also an anonymous production, but equally due to the pen of Mr. Backhouse, aided by Mr. Ronald Gunn. The first Memoir is

short, but of so generally interesting a character, that we are persuaded our readers will not be displeased at seeing the account transferred to these pages.

ON THE ROOTS AND OTHER INDIGENOUS ESCULENTS OF VAN DIEMEN'S LAND.

The most extensively diffused eatable roots of Van Diemen's Land, are those of the *Tara Fern*, and of various plants of the Orchis Tribe. The former greatly resembles *Pteris aquilina*, the common *Fern, Brake, Breckon,* or *Bracken* of England, and like it, throws up its single stems at short distances, covering great extents of light and rich land. The Van Diemen's Land plant is *Pteris esculenta*, called, among the Aborigines, by the name of *Tara;* the same appellation as is given by the inhabitants of the South Sea Islands to a variety of esculent seeds and roots. *Pteris esculenta* is known among the European inhabitants as the *Fern*, in common with many other plants of the same tribe; none of which, however, spread over extensive portions of open land in the same manner. It varies in height from a few inches to several feet, according to the richness of the soil, and in some parts of the colony is so tall as to conceal a man on horseback. The root is not bulbous, but creeps horizontally at a few inches below the surface of the earth, and when luxuriant, attains the thickness of a man's thumb. Pigs feed upon this root where it has been turned up by the plough, and in sandy soils they will themselves grub up the earth in search of it. The Aborigines roast it in the ashes, peeling off its black skin with their teeth and eating it as sauce to their roasted Kangaroo, &c., in the same manner as Europeans use bread. The root of the *Tara Fern* possesses much nutritive matter; yet it is observed that persons who have been reduced to the use of it, in long excursions through the bush, have become very weak, though it has supported life. Whether this arose from an insufficient supply, in consequence of the parties being too much exhausted to dig it up before they resorted to it, or from eating it raw, or some other cause, I am not able to determine. It is quite certain that when this substance is grated or reduced to a pulp by beating and mixing with cold water, a large quantity of *Arrow Root* is precipitated, which adheres to the bottom of the vessel, and which may easily be prepared for use by pouring off the water and floating matter, adding fresh water, and stirring up the white powder and again allowing it to settle. It may then be cooked by boiling, or the powder may be spread on cloths and dried in the sun, or hung up in linen bags, where there is a free circulation of air. Many vegetables yield *Arrow Root*, which, when well prepared, cannot be distinguished from that produced by the *Maranta arundinacea;* but it is essentially necessary, from whatever it is obtained, that it be dried quickly, without great heat, as too much heat renders it gluey.

Small bulbs of the *Orchis Tribe* of plants are very generally diffused over the open and thinly wooded parts of Van Diemen's Land; they are eaten by the Aborigines, and by Cockatoos, Bandicoots and Kangaroo Rats, &c. Little holes are often seen where the latter animals have been scratching for them. *Gastrodia sesamoides*, a plant of this tribe, which springs particularly from the decaying roots of the *Stringy Bark* (*Eucalyptus robusta*) produces bulb-tubers, growing one out of another, of the size and nearly the form of kidney potatoes, the lowermost being attached by a bundle of thick fleshy fibres to the base of the tree whence it derives its nourishment. These roots are roasted and eaten by the Aborigines; they resemble beetroot in taste, and are sometimes called in the Colony *Native Potatoes.*

There are also a few other native plants, producing small tubers, which are eaten by the aboriginal population, but none of them are worthy of being compared with the *common Potato* or *Turnep.*

The native Blacks of Van Diemen's Land split open about a foot and a half of the top of the trunk of the *common Tree Fern* of the Colony (*Cybotium Billardieri*) and taking out the heart, which re-

sembles a Swedish Turnep in substance, and is as thick as a man's arm, they roast it in the ashes, and eat it like bread; but it is too bitter and astringent to suit an English palate. It is said that the Aborigines prefer the heart of *Alsophila australis,* a larger species of Tree-Fern, found at Macquarrie's Harbour and other places on the western side of Van Diemen's Land.

A species of *Tuber*[1] is often found in Van Diemen's Land, attaining to the size of a child's head: it is known by the name of *Native Bread,* and in taste somewhat resembles boiled rice. Like the heart of the *Tree-Fern* and the root of the *Native Potato,* cookery produces little change in its character; I have often asked the Aborigines how they found the *Native Bread,* and have universally received the answer, "a rotten tree."

An esculent fungus grows in clusters around swollen portions of the branches of the Myrtle of this colony, (*Betula antarctica*—this tree, however, is not a *Betula,*) in the western part of the island. It varies from the size of a marble to that of a walnut; when young, it is of a pale colour, whitish and covered with a skin like that of a young Potato: this skin is easily taken off, and the remaining portion, when raw, tastes like cold cow-heel. When this fungus is matured, the skin splits and exhibits a sort of net-work of a yellowish-white colour. The large white fungus, called in the colony *Punk,* which grows from the Stringy Bark (*Eucalyptus robusta*), is said to be eaten, when fresh, by the natives.

It is almost unnecessary to mention the *common Mushroom,* so abundant in many parts of the island, and of so agreeable a flavour. It seems precisely the same as the Mushroom of England (*Agaricus esculentus*).

The blanched portion at the base of the inner leaves of some *Rushes,* and of a flat sedgy plant, growing on the sand-hills of the coast, having the mature leaves an inch wide, and deep green, are eatable, and of a milky flavour. The flowers of this plant, to a common observer, resemble those of Rushes, they grow in clusters on a stem as flat and broad as the leaves.

The base of the inner leaves of the *Grass-Tree* (*Xanthorrhœa arborea*[2]) are not to be despised by the hungry. The Aborigines beat off the heads of these singular plants by striking them about the top of the trunk with a large stick; they then strip off the outer leaves and cut away the inner ones, leaving about an inch and a half of the white tender portion joining the trunk: this portion they eat raw or roasted, and it is far from disagreeable in flavour, having a nutty taste, slightly balsamic. There are some other species of *Grass-Tree* in the colony, the base of the leaves of which may also be used for food: those of the *Dwarf Grass-Tree* (*Xanthorrhœa humilis*), so abundant about York-Town, may be obtained by twisting the inner leaves firmly together, and pulling them forcibly upwards; but care is required not to cut the fingers by slipping the hand.

The Esculent Fruits of Van Diemen's Land are not numerous, nor are any of them worthy of comparison with the commonest English kinds. They rank in value nearly in the following order:—

Solanum laciniatum (Bot. Mag. t. 349.), the *Kangaroo-Apple,* resembling the apple

[1] This is a very curious Fungus, and nearly allied to the North American *Sclerotium Cocos* of Schweinitz. I have specimens from Mr. Gunn.—Ed.

[2] A portion of the noble stem of this plant, which forms so striking a feature in one of the plates in Flinders' Voyage to Australia, was sent from Australia to the Mauritius, and thence, after some delay, to us in Scotland. It was placed in our private collection, and after a lapse of nearly, if not quite, three years from the time of its being severed from the parent tree, it shot out a beautiful tuft of leaves from the extremity: but though every means was taken to encourage the continued vegetation of the plant, the leaves soon perished. It was after this period that, being placed in the same museum, an Entomologist was gratified by this stem giving birth (at different times, and during a space of two years) to several living specimens of a rare Beetle, apparently a new *Cerambyx,* of a beautiful chestnut-colour, about two inches in length, exclusive of the antennæ, with which several Cabinets have been supplied. The same insect has also been taken in New Holland by Dr. Logan.—Ed.

of a Potato; when so ripe as to split, it has a mealy subacid taste.

Mesembryanthemum equilaterale; Pig-faces, called by the Aborigines by the more elegant name of *Canagong*. The pulp of the almost shapeless but somewhat obconical fleshy seed-vessel of this plant is sweetish and saline; it is about an inch and a half long, of a yellowish, reddish, or green colour.

Polygonum adpressum (Bot. Mag. t. 3145). The *Macquarie Harbour Vine,* either as an insignificant trailing plant, or as a magnificent climber, according to soil and situation, is found on the coast of various parts of Van Diemen's Land, and also as far inland as within four miles of New Norfolk. This plant has a small but sweet fruit, formed of the thickened divisions of the calyx of the flower, enclosing a triangular seed of unpleasant flavour.

Gaultheria hispida, the *Wax-Cluster,* abundant in the middle region of Mount Wellington, and in other elevated and moist situations of the Colony. This fruit is formed by the thickened divisions of the calyx, enclosing the small seed-vessel, which, when ripe, is of a snowy white. The flavour is difficult to describe, but not unpleasant; in tarts it somewhat resembles young gooseberries, with a slight degree of bitterness.

Astroloma humifusa (Bot. Mag. t. 1439). The *native Cranberry* has a fruit of a green, reddish, or whitish hue, about the size of a black currant, consisting of a viscid, apple-flavoured pulp, enclosing a large seed; this fruit grows singly on the trailing stems of a small shrub resembling Juniper, bearing beautiful scarlet blossoms in autumn.

Leucopogon Gnidium (probably *Leucopogon Richeii,* Bot. Mag. p. 325.—Ed.) A large bush, with numerous harsh leaves, growing along the sea-shore with some other smaller inland shrubs of the same tribe, produces very small white berries of a sweetish and rather herbaceous taste. These are called, promiscuously, *Red* or *White Currants* in the Colony. There are in the mountains some dry red-berried shrubs allied to this, the fruit of which may serve to allay hunger, but is too disagreeable to be eaten under other circumstances.

Oxalis microphylla, Yellow-flowered Sorrel. This little plant, which displays its lively yellow blossoms on almost every grassy spot in the Colony, and has acid leaves resembling in form those of Clover, is very pleasant, eaten raw, to allay thirst, and when made into tarts is almost equal to the Barberry.

Casuarina torulosa. The *She Oak.* The young fruit and young shoots afford an agreeable acid by chewing, which allays thirst.

Leptospermum lanigerum, Hoary Tea-Tree.—Acacia decurrens, Black Wattle.—Corræa alba, Cape Barren Tea.—The foliage of all these has been used for tea in the Colony, as have also the leaves and bark of *Cryptocarya glaucescens,* the Australian Sassafras.

I do not think it necessary to enter upon any description of the *Barilla Shrubs,* (*Atriplex Halimus, Rhagodia Billardieri,* and *Salicornia Arbuscula,*) which, with some others, under the promiscuous name of *Botany Bay Greens,* were boiled and eaten along with some species of sea-weed by the earliest settlers, when in a state of starvation. The thick young shoots of some of the humbler species of *Salicornia,* would, no doubt, like that of the *S. annua* (*Glass-wort,* or *Marsh Sampire* of England) be serviceable for pickling.

CONTRIBUTIONS TOWARDS A FLORA OF SOUTH AMERICA AND THE ISLANDS OF THE PACIFIC.

By Sir W. J. Hooker, LL.D. and G. A. W. Arnott, Esq., A.M. F.R.S.E.

I. Extra-Tropical South America.

(Continued from Vol. I. p. 244, of this Work.)

In addition to the collections of *extratropical South American plants,* mentioned at p. 234 of our first volume, as having been lately received by us, we have now

the pleasure to announce another, which we owe to the kindness of the Rev. Professor Henslow. It was formed by C. Darwin, Esq., of H. M. S. Beagle, in various countries between Maldonado, in the North, and Terra del Fuego, in the South, including the Falkland Islands,[1] and hence, as may be supposed, it has afforded several new plants, and new localities for some rarities which had been described before.

In order to render our Catalogue as complete as opportunities will allow, we have thought it best, before printing the continuation of the *Compositæ*, to introduce several plants recently received, which belong to such groupes of this family as have already been treated of in the first volume of this Work.

HYPOCHÆRIDEÆ. *Less.—Hook. et Arn. hujusce vol. p.* 30.

735. (4.) Seriola *apargioides*, Less.—Var. *glabra.*—Add, an Hypochæris arenaria? *Gaudich. in Freyc. Voy. p.* 46. —Falkland Islands and Port Desire, *C. Darwin, Esq.* (*n.* 338.) Port Gregory, Patagonia. (*Herb. nostr.*)

737. (7.) Add, Seriola *incana* (Hook. et Arn.) *n. sp.;* tota tomento deciduo canescens, caule simplici monocephalo, foliis radicalibus anguste linearibus subulato-pungentibus subsessilibus exterioribus integerrimis intimis pinnatifidis segmentis remotis linearibus brevibus, involucri foliolis lanceolato-acuminatis obtusis.—St. Julian, *C. Darwin, Esq.* (*n.* 347.)—A small annual plant, three to four inches high, with the scapiform stem scarcely twice as long as the radical leaves, and bearing one or two leafy bracteas.

739. (1.) Macrorhynchus *Chilensis*, Less. —Add, Falkland Islands, *C. Darwin, Esq.* (*n.* 335.)

740. (1.) Sonchus *oleraceus*, L.—Add, Bahia Blanca, coast of Patagonia, *C. Darwin, Esq.* (*n.* 342.)

751. (1.) Picrosia *longifolia*, Don.—Add, S. Chili, *Mr. Reynolds.* (*n.* 45.)

751* (1.) Add Hedypnois *rhagadiloides*, Willd.—Banda Orientale, *Tweedie.*—Probably introduced.

758. (5.) Trixis *discolor*, Gill.—Add, Woods of Tucuman, *Tweedie.* (*n.* 1157.)

759. (6.) Trixis *papillosa*, Gill.—Add, St. Jago and Tucuman, frequent, *Tweedie.* (*n.* 1129.)

[1] Some interesting extracts from the letter addressed by this gentleman to Professor Henslow, chiefly relating to the Geology of the countries, have been printed by the latter for private distribution.

761* (2*.) Add Perezia (Homœanthus) *squarrosa*, Less. *in Linnæa, v.* 5. *p.* 13.—Perdicium squarrosum, *Vahl, in Skrivt. Nat. Selsk v.* 1. *p.* 11. *t.* 6.—Homœanthus ambiguus, *Cass.*—Chætanthera ciliata, *Spr.* (non *R. et P.*)—Banks of the Uraguay, near Salta, *Tweedie*, who observes that the flowers have the odour of violets.—Lessing describes this plant as having the foliola of the involucre entire: but they are not so in our plant, nor in the original one of Vahl, according to the latter author.

763.* (4.*) Add, Perezia (Stenophyllum) *recurvata*, Less. *in Linnæa, v.* 5. *p.* 21. *Syn. Comp. p.* 412.—Perdicium recurvatum, *Vahl, in Skrivt. Nat. Selsk. v.* 1. *p.* 10. *t.* 7.—Homœanthus echinulatus, *Cass. Dict. v.* 38. *p.* 455.—Port Desire, *C. Darwin, Esq.* (*n.* 311.) Port George, Patagonia. (*Herb. nostr.*)

763.** (4.**) Add, Perezia (Stenophyllum) *linearis*, Less. *Syn. Comp. p.* 412. —Add, Araucania, *Mr. Reynolds.* (*n.* 16.)

763.*** (6.*) Add, Perezia *lanigera* (Hook. et Arn.), *n. sp.;* nana, subacaulis, cæspitosa, foliis subulatis rigidis pungentibus marginibus revolutis glabris integerrimis basi dilatato-amplexantibus axillis dense lanigeris, involucri foliolis oblongis mucronatis omnibus integerrimis.—Port Desire, *C. Darwin, Esq.* (*n.* 314.)—A very small, cæspitose plant, scarcely an inch high, with rigid, subulate leaves, longer than the stem. The nearest affinity of this is with the section "*Stenophyllum,*" Less.; but the leaves and involucres are quite destitute of teeth or ciliæ.

764. (5.) Perezia (Euperezia) *Magellanica*, Less.—Add, Cape Tres Montes, *C. Darwin, Esq.* (*n.* 369.)

767.* (9.) Add, Perezia (Clarionia) *lactucoides*, Less. *in Linnæa, v.* 5. *p.* 22. *Syn. Comp. p.* 413.—Perdicium lactucoides, *Vahl, in Skrivt. Nat. Selsk. v.* 1. *p.* 10. *t.* 5.—Straits of Magellan, at Cape Negro, *C. Darwin, Esq.* (*n.* 315.)

769. (1.) Leuchæria *senecionides*, Hook. et Arn. — Add, Araucania, *Mr. Reynolds.* (*n.* 20.)

773. (5.) Leuchæria *runcinata*, Gill.—Add, Araucania, *Mr. Reynolds.* (*n.* 1.)

776.* (8.*) Add, Leuchæria *volcanica* (Hook. et Arn.), *n. sp.;* caule arachnoideo albo-tomentoso subsimplici eglanduloso, foliis lineari-lanceolatis pinnatifidis basi attenuatis superioribus integerrimis segmentis patenti-recurvis mucronato-acuminatis, involucri campanulati foliolis oblongo-lanceolatis acumi-

natis eglandulosis, ligula oblonga.—Volcano of Antuco, S. Chili, at an elevation of six thousand feet above the level of the sea, *Mr. Reynolds.* (*n.* 103.)—Allied in general habit to *L. Gilliesii*, but the leaves are different, and it altogether wants the glandular hairs of that species.

776.** (8.*) Add, Leuchæria (Cassiopea) *achillæifolia* (Hook. et Arn.); caule gracili dichotome ramoso puberulo, foliis remotis bipinnatifidis segmentis parvis ovatis obtusis, axillis rachibusque præcipue dense lanosis, involucri campanulati foliolis lineari-oblongis obtusiusculis puberulis, ligula oblonga.—Port Desire, *C. Darwin, Esq.* (*n.* 391.)—This plant is about six to eight inches high, and differs remarkably from the other species of this section and genus.

779.* (12.) Add, Leuchæria (Lasiorrhiza) *purpurea*, Less.—Perdicium purpureum, *Vahl, in Skrivt. Nat. Selsk. v.* 1. *t.* 3.—E. coast of Terra del Fuego, *C. Darwin, Esq.* (*n.* 376.)

779.* (13.) Add, Leuchæria (Lasiorrhiza) *gossypina* (Hook. et Arn.); dense lanata, caule simplici folioso unifloro, foliis radicalibus — ?, caulinis plurimis lato-lanceolatis acuminatis supra subdenudatis, involucri campanulati foliolis oblongo-lanceolatis obtusis, ligula oblonga.—East Falkland islands, *C. Darwin, Esq.* (*n.* 355.)—A very remarkable plant, of which we do not possess the root-leaves. The stem and cauline leaves, and, especially, the involucre, which is nearly as long as the florets, are clothed with very thick and fine cottony wool, which seems partially to wear off from the upper side of the foliage.

784.* (4.) Add, Panargyrum (Piptostemma) *Darwini* (Hook. et Arn.); cæspitosum basi ramosum, foliis lineari-subulatis pungentibus integerrimis appresso-sericeis, capitulis congestis.—Port Desire, *C. Darwin, Esq.* (*n.* 313.) Port Gregory, Patagonia, near the Straits of Magellan. (*Herb. nostr.*)—Very different from *P. spinosum*, which has the nearest affinity with it, in the unarmed leaves, and their white silky surface. The pappus is very plumose and silky and exceedingly caducous.

784.* (5.) Add, Panargyrum (Pipto-) stemma, Don,) *abbreviatum* (Hook. et Arn.) *n. sp.;* cæspitosum basi ramosum, foliis patenti-recurvis lineari-acuminatis mucronatis integerrimis glabris basi ciliatis, axillis tomentosis, capitulis congestis.—Fort Gregory, Patagonia. (*Herb. nostr.*)—This is not dissimilar in habit to the other individuals of the section (*Piptostemma*); but its pappus, as in the preceding species (*P. Darwini*) is much more plumose than in the original *P. plumosum*, although much less so than in *Caloptilion*, in which last the pappus is also deciduous; so that were it not for the difference in habit, the Piptostemma-group might be united with *Caloptilion.*

788.* (2.) Add, Acanthophyllum *rosulatum* (Hook. et Arn.); nanum cæspitosum, e basi ramosum, foliis sublanosis primariis lato-subulatis spinescentibus basi amplexantibus, secundariis brevissimis obtusis concavis rosulatis caulis partes inferiores densissime tegentibus, capitulis subglomeratis lateralibus brevipedunculatis.—Port Desire, *C. Darwin, Esq.* (*n.* 324.)—This is a most remarkable looking little plant, with the secondary leaves forming beautiful rosulæ in the axils of their primary ones, which latter they soon obliterate, and clothe entirely the old parts of the stems.

789.* (1.) Triptilion *spinosum*, R. et P.—Add, South Chili; *Mr. Reynolds.* (*n.* 105.)

790.* Add, Triptilion *capillatum*, Hook. et Arn.—Nassauvia capillata, *Don in Phil. Mag. Apr.* 1832, *p.* 390*; in Guill. Arch. v.* 2. *p.* 465.—Baths of Collina, Chili, *Mr. Macrae.*—Pappus as in *Triptilion spinosum;* but the habit of the plant is more slender than that species, more diffuse, the leaves thinner, their laciniæ or serratures furnished with a much longer and less rigid point.

790.** (1.) Mastigophorus *Gaudichaudi*, Cass. *Dict. Sc. Nat. v.* 34, *p.* 222.—Nassauvia Gaudichaudi, *Cass. in Gaudich. Ann. Soc. Nat. v.* 5. *p.* 103. *t.* 3. *f.* 3.—Falkland Islands, *C. Darwin, Esq.* (*n.* 327, 328.)

MUTISIACEÆ. *Cass.—Hook. et. Arn. l. c. p.* 102.

796. (2.) Chevreulia *stolonifera*, Cass.—Add, Banda Orientale, *Tweedie.*

801. (1.) Leria *nutans, DC.*—Add, Bahia Blanca, Coast of Patagonia, *C. Darwin, Esq.* (*n.* 349.)

806.* Trichocline *maxima*, Less. *in Linnæa, v.* 5. *p.* 290.—Rio Grande do Sul, S. Brazil, *M. Isabelle.*

806.** (7.) Add, Trichocline *foliosa* (Hook. et Arn.), *n. sp.;* caule folioso albo-tomentoso, foliis lineari-spathulatis integerrimis subtus albo-tomentosis, involucri foliolis uniformibus folia subsi-

mulantibus squarroso-patentibus oblongo-acuminatis subtus albo-tomentosis. —Rio Grande do Sul, S. Brazil, *M. Isabelle*.—The portion of the stem which we have is rather more than a foot long, bearing leaves to the summit, where they become smaller, but more crowded, and pass gradually into the leaflets of the involucre, which are all alike, and singularly lax, large, and very patent.

828*. (1*.) Add, Mutisia *truncata*, Don, *in Linn. Trans. v.* 16. *p.* 269.—Province of Maule, *Cuming* (*n.* 83.); St. Mary, S. Patagonia, *Dr. Eights;* Antuco, in S. Chili, *Mr. Reynolds.* (*n.* 105. 38.) —Upon a close comparison of this plant with *M. spinosa*, we are inclined to consider it distinct from that species. It has a more southern locality; its leaves are thinner, less toothed, they turn black in drying, and the peduncle is longer. Our South Patagonia and Maule stations of *M. spinosa*, must now be referred to this plant.

833. (6). Mutisia *subspinosa*, Cav.—Add, Araucania? *Mr. Reynolds.* (*n.* 15.)—Our specimens of this are too imperfect to enable us to decide with certainty as to the species.

834 (7.) Mutisia *subulata*, R. et P.—and *Cavanillesii*, Valley of Antuco, S. Chili, *Mr. Reynolds.* (*n.* 16. 106.)

845. (6.) Gochnatia (Nardophyllum) *revoluta*, Don.—We have now seen flowers of this plant, and find the anthers to be *ecaudate;* so that it must be removed from the present genus (as now constituted), and we would propose for it the following name and character:

NARDOPHYLLUM, *Hook et Arn.* (Nov. Gen.)

Capitulum 5—6-florum, homogamum, homocarpum. *Rachis* ebracteolata.) *Flosculi* 5—6, tubulosi regulares. *Filamenta* lævia glabra. *Antheræ*, ecaudatæ. *Stylus* glaberrimus elongatus. *Achenium* sericeo-villosum. *Pappus* conformis pluriserialis subplumosus. *Involucrum* involucratum, foliolis scariosis acuminatis.—Frutices, *ramis junioribus albo-tomentosis.* Folia linearia, *rigida.* Capitula *terminalia solitaria.*

1. Nardophyllum *revolutum*, Hook. et Arn.—Gochnatia revoluta, *Don.—Hook. et Arn. l. c.*—To this genus we have to add a second species.
2. Nardophyllum *obtusifolium* (Hook. et Arn.) *n. sp.;* foliis teretibus obtusissimis patenti-recurvis subdecurrentibus dorso sulcatis. — Port Desire, *C. Darwin, Esq.* (*n.* 325.—This is a small shrubby species, three to four inches high, much branched upwards. Leaves one and a half line long.—It may readily be distinguished from the preceding by the very rounded, blunt, and somewhat decurrent leaves.

849. (4.) Chuquiraga *oppositifolia*, Gill.—Add, Port Desire, *C. Darwin, Esq.* (*n.* 312.)

853. (5.) Chuquiraga *erinacea*, Gill.—Add, Bahia Blanca, Coast of Patagonia, *C. Darwin, Esq.* (*n.* 329.)

VERNONIEÆ. *Less.—Hook. et Arn. l. c. p.* 236.

875*. (6.*) Add, Vernonia *squamulosa* (Hook. et Arn.), *n. sp.;* fruticosa, foliis oblongis subcoriaceis brevi-petiolatis integerrimis v. subserratis supra scabris subtus puberulis, capitulis corymbosis, involucri turbinati squamis oblongis obtusis erectis inferioribus numerosissimis minutis squamæformibus imbricatis longe descendentibus, achenio pubescente, pappo exteriore brevi latiore.—Plentiful in woods of Tucuman, *Tweedie.* (*n.* 1224).—A very remarkable species, with the base of the involucre singularly attenuated into a stalk, and clothed with minute closely imbricated scales.

889* (21?) Add, Vernonia *cinerea*, Less. Hab.?—*C. Darwin, Esq.*—The station of this is not indicated upon the ticket. If found in extratropical S. America, it is probably introduced. We had previously only seen East Indian specimens.

918*. (16*.) Add, Eupatorium *dodoneæfolium* (Hook. et Arn.), *n. sp.;* fruticosum ubique glutinosum, foliis alternis anguste lanceolatis in petiolum brevem attenuatis dentatis coriaceis glanduloso-punctatis pinnatim-nervosis, corymbis densis terminalibus, involucri oblongi pluriserialis foliolis nitidis glabris exterioribus brevibus oblongo-ovatis, intimis linearibus acuminatis flosculos æquantibus.—Plentiful in the plains of St. Jago and Mendoza, *Tweedie.* (*n.* 1208.)

920. (18.) Eupatorium *tremulum; β.* Hook. et Arn.—Add, Plains of Mendoza, *Tweedie.* (*n.* 1207.)

940. (38.) Eupatorium *glechonophyllum*, Less.—Add, Valparaiso, *C. Darwin, Esq.* (*n.* 377.)

If the species now mentioned (23) be added to those already noticed, it will make the number 976; so that we continue our memoir with *n.* 977.

TRIB. VII.—ASTEROIDEÆ.—*Less.*

SUB-TRIB. I.—ASTEREÆ.—*Less.*

977. (1.) Chilotrichium *amelloides*, Cass. —Berkeley Sound, Falkland Islands. *C. Darwin, Esq.* (*n.* 321.)

978. (1.) Grindelia *speciosa*, Gill.; "suffruticosa glutinosa, foliis petiolatis cuneato-lanceolatis acutis dentatis planis, involucro subgloboso squarroso foliolis basi ovatis appressis coriaceis apice elongato-subulato recurvato-patenti ligulis dimidio breviore." *Don.* — Foot of the Andes of Mendoza, *Dr. Gillies.*

Caulis erectus, bi-tripedalis, purpurascens. *Folia* 2—3-pollicaria. *Capitulum* solitarium, magnum. *Radii* aurei: *flosculi* pollicares. *Don.*

979. (2.) Grindelia[1] *puberula* (Hook. et Arn.); suffruticosa, tota puberula, ramis usque ad capitulum foliosis, foliis obovato-ellipticis semiamplexicaulibus basi auriculatis mucronatis argute dentato-serratis, involucri foliolis lanceolato-subulatis fusco-puberulis, radio involucrum plus duplo superante. — Dry woods in the colony of Victoria, *Tweedie.*

980. (3.) Grindelia *diffusa*, Gill.; "suffruticosa ramosissima glutinosa, foliis sessilibus angusto-oblongis mucronatis spinuloso-dentatis, involucro globoso squarroso foliolis e basi appressa lanceolato-subulatis revolutis, radio involucrum duplo superante." *Don.* — Province of San Luis, San Isidro, and Andes of Mendoza, *Dr. Gillies;* Fort Argentino, Patagonia, *Tweedie;* Port Desire, *C. Darwin, Esq.* (*n.* 383.)

981. (4.) Grindelia *discoidea* (Hook. et Arn.); fruticosa subglutinosa, foliis oblongo-linearibus mucronatis spinuloso-dentatis, involucri hemisphærici squarrosi foliolis exterioribus e basi appressa linearibus recurvis, radio nullo.—Monte Video and Maldonado. *Tweedie.*—Perhaps this may be a variety of *G. diffusa*, of which it has the habit; but none of our specimens from different localities, and gathered at different periods, possess any ray to the capitula.

982. (5.) Grindelia *scorzonerifolia* (Hook. et Arn.); suffruticosa, foliis anguste linearibus sessilibus semiamplexicaulibus basi æqualibus v. paulo latioribus apice acuminatis mucronatis subintegerrimis, involucri foliolis e basi ovata breviter subulatis, radio involucrum duplo superante.—Parana, Buenos Ayres, and Rio, *Tweedie.*—A dwarf plant, with singularly narrow leaves, and very slightly branched stems.

983. (6.) Grindelia *resinosa*, Gill.; "suffruticosa glutinosa, foliis lineari-lanceolatis acutis spinuloso-dentatis integerrimisve basi in petiolum attenuatis involucro hemisphærico ligulis dimidio breviore, foliolis e basi ovato elongato-subulatis." *Don.*—Abundant near Las Arbolitas, Mendoza; *Dr. Gillies.*

984. (7.) Grindelia *foliosa*, Don; "suffruticosa glutinosa, foliis basi attenuatis lanceolatis acutis dentatis vel integerrimis undulatis, involucro hemisphærico radio subdimidio breviore foliolis e basi ovata subbreviter subulatis." *Don.*—Andes of Chili and Mendoza, and banks of Rio Diamante, *Dr. Gillies.*—This species appears to us to be too closely allied to the last, differing only by the broader leaves, which have an inclination to become wavy; by the larger capitula; and by the broader leaflets of the involucre, which have shorter points.

985. (8) Solidago *odora*, Willd. (*ex Lessing in Linnæa, v.* 6. *p.* 125.)—S. Chilensis, *Kunze.*—*α. glabriuscula;* acheniis sparse et breviter pilosis. S. Bonariensis. *Don,* MSS. Buenos Ayes; Laguenilla, near Mendoza, *Dr. Gillies;* Chili, *Cuming* (*n.* 68.), *Bridges.*—*β. scabra;* acheniis sparse pilosis.—Monte Video, *Tweedie.*—*γ. glabra;* acheniis glabris. —S. repens. *Don,* MSS. — Mendoza, and banks of the Rio Uspallata, *Dr. Gillies;* Buenos Ayres, Maldonado, and N. Patagonia, *Tweedie;* Chili, *Mr. Cruikshanks;* Sta. Cruz of Buenos Ayres, *C. Darwin, Esq.* (*n.* 354.)

986. (9.) Diplopappus *foliosus* (Hook. et Arn.); fruticosus glutinosus, ramis crassis densissime foliosis, foliis obovato-spathulatis reflexis rigidis dentato-spinosis, floribus solitariis terminalibus, involucri foliolis erectis linearibus obtusis membranaceis margine scariosis, achenio parce pubescente, pappi serie exteriore dimidio breviore conformi.—Fissures of rocks near the bay, Villa de la Mar, Chili, *Bridges, Cuming.* (*n.* 66.)

987. (10.) Diplopappus *mucronatus*, (Hook. et Arn.)—Baccharis mucronata, *Hook. et Arn. Bot. of Beech. Voy. p.* 30.—Coquimbo, *Messrs. Lay et Col-*

[1] All the North American species called *Donia*, have the anthers without awns at the base, and belong therefore to *Grindelia*. Lessing's *Donia Canariensis* alone agrees with his generic character, and the name may be retained for it. Of *Grindelia*, the best characters of the species seem to be taken from the shape of the involucre; but it must be confessed that it is very difficult to define their limits in a satisfactory manner.

lie; Valparaiso, *Cuming,* (*n.* 73.) *Macrae.*

988. (11.) Diplopappus *foliosus* (Hook. et Arn.); fruticosus glutinosus, ramis usque ad apicem foliosis, foliis obovato-rotundatis sessilibus coriaceis, mucronato-dentatis resinoso-punctatis, capitulis terminalibus subglomeratis, involucri foliolis oblongis erectis obtusis scarioso-marginatis interioribus augustioribus, achenio lineari-elongato sericeo, pappi serie exteriore interiore plusquam dimidio breviore conformi. — Exothamnus ilicifolius, *Don,* MSS.—Andes of Mendoza, *Dr. Gillies.*—In all Dr. Gillies' specimens there is no ray to the flowers, on which account it appears Mr. Don made it a new genus: but the habit is so much that of *D. mucronatus,* which has usually a ray, that we are unwilling to separate it from *Diplopappus.*

989. (12.) Diplopappus *spinulosus* (Hook. et Arn.); fruticosus humilis subsimplex, foliis obovato-lanceolatis acutis mucronatis spinoso-dentatis rigidis reticulatis ciliatis, pedunculo solitario terminali elongato bracteato pubescenti-tomentoso monocephalo, involucri foliolis imbricatis subpubescentibus lineari-oblongis exterioribus brevioribus mucronatis, achenio sericeo, pappi serie exteriore conformi interiore subduplo breviore.—Las Cuevillas, Andes of Mendoza.—*β.* foliis hirsuto-pubescentibus. Port Desire, *C. Darwin, Esq.* (*n.* 310.)

990. (13.) Diplopappus *inuloides,* (Hook. et Arn.); fruticosus subramosus, foliis obovato-lanceolatis acutis mucronatis spinoso-dentatis rigidis reticulatis ciliatis, pedunculo terminali solitario elongato bracteato subglabro monocephalo, involucri foliolis numerosis imbricatis glabriusculis lineari-subulatis pungentibus uniformibus, achenio sericeo.—Cliffs, Valparaiso; *Bridges, Cuming,* (*n.* 404.)

991. (14). Diplopappus *grindelioides* (Less); caule herbaceo ramoso glabro, foliis obovato-spathulatis obtusis inæqualiter spinoso serratis submembranaceis obscure reticulatis glabris, pedunculis elongatis terminalibus remote bracteatis monocephalis, involucri glabri foliolis numerosis imbricatis lineari-subulatis subpungentibus uniformibus, achenio sericeo.—D. grindelioides, *Less. in Linnæa, v.* 6. *p.* 115.—Valparaiso, *Cuming* (*n.* 502.) *Mathews* (*n.* 331.)—This is decidedly a herbaceous plant, with very obtuse spathulate leaves, and capitula which are an inch and a half in diameter. The original species of Lessing seems to differ by the pubescent leaves.

992. (15.) Diplopappus *cuneatus* (Hook. et Arn.); pumilus fruticosus glaber, caule brevi dense folioso, foliis obovato-cuneatis coriaceis subpetiolatis obtuse dentatis dentibus brevi-mucronulatis obscure reticulatis, pedunculo terminali remote bracteato monocephalo, involucri imbricati foliolis lineari-oblongis mucronulatis subundulatis uniformibus exterioribus brevioribus, achenio sericeo.—Aplopappus diversifolius, *Don, MSS.*—Cumbre of the Cordillera of the Andes, *Dr. Gillies.*—A small and apparently very distinct plant, with the peduncle equal in length with the very leafy stem. Capitula an inch and a quarter in diameter.

993. (16.) Diplopappus *bellidifolius* (Hook. et Arn.); fruticosus glaber glutinosus, caule brevi ramosissimo dense folioso, foliis obovato-spathulatis in petiolum angustum attenuatis grosse acute dentatis obtusis rigidis, pedunculis gracilibus parcissime bracteatis monocephalis, involucri imbricati foliolis lineari-subulatis subpungentibus uniformibus exterioribus multo brevioribus, achenio sericeo.—Cordillera of Chili, *Cuming* (*n.* 233.); Los Ojos de Agua, *Bridges* (*n.* 224.—Scarcely larger than the preceding, very much branched, with numerous slender peduncles almost destitute of bracteas. Capitula nearly an inch in diameter.

994. (17.) Diplopappus *macrocephalus,* Pœpp.; caule fruticoso subnullo, foliis rosulatis obovato-spathulatis obtusis basi in petiolum gracilem attenuatis glutinosis rigidis argute ciliato-serratis ciliis spinescentibus albis, pedunculo scapiformi 1—2-bracteato vernicoso monocephalo, involucri imbricati foliolis numerosis lineari-subulatis pungentibus exterioribus minoribus uniformibus, achenio sericeo.—*Less. in Linnæa, v.* 6. *p.* 114.—Maule province, *Cuming* (*n.* 840.); S. Chili, *Mr. Reynolds.* (*n.* 152.)—This is a very beautiful and well-marked species, which we think is the one described by Lessing under the above name: but we must confess that in the present, and in numerous other instances of the like kind, we find the greatest difficulty in discriminating that author's species, on account of the very diffuse descriptions, and the total absence of specific characters.

995. (18.) Diplopappus *coronopifolius,* Less.; fruticosus glaber, caule brevi decumbente, ramis numerosis cæspitosis

valde foliosis, foliis lineari-spathulatis rigidis pinnatifidis subbipinnatifidisque laciniis oblongis acutis mucronatis, pedunculis gracilibus nudis v. hic illic bracteolatis monocephalis, involucri glabri foliolis imbricatis lineari-subulatis subpungentibus exterioribus minoribus uniformibus, achenio sericeo.—*Less. in Linnæa, v.* 6. *p.* 112.—Aplopappus glutinosus, *Cass.* (*ex Less.*)—Conception, *Cuming* (*n.* 818.); Valdivia, shady places near rivers in Los Andes, *Bridges.* (*n.* 640.)—This likewise is a small, but very distant and well-marked species, with copious foliage of a pale and almost glaucous hue.

996. (19.) Diplopappus *Coquimbensis* (Hook. et Arn.); fruticosus pubescens, ramis elongatis, foliis obovato-lanceolatis coriaceis grosse dentato-serratis in petiolum attenuatis, pedunculis elongatis bracteatis v. nudis monocephalis, involucri pubescentis foliolis imbricatis lineari-subulatis acuminatissimis exterioribus uniformibus, radio involucrum superante, achenio sericeo, pappo rufo.—Coquimbo, *Cuming* (*n.* 892.); Valparaiso (?) *Macrae.*—Closely allied to the following, but the leaves are shorter, broader upwards, more petiolated, and the pappus is of a very red-brown colour. Mr. Macrae's specimen precisely accords with that from Mr. Cuming, whence we are led to infer that it may probably have been gathered in the same locality.

997. (20.) Diplopappus *canescens* (Hook. et Arn.); fruticosus, ubique canescenti-tomentosus, foliis lanceolatis coriaceis in petiolum attenuatis grosse acute dentatis dentibus subrecurvis, pedunculis elongatis bracteatis v. subfoliosis monocephalis, involucri pubescentis foliolis lineari-acuminatis exterioribus minoribus angustioribus, radio involucrum superante, achenio sericeo, pappo testaceo.—Chilian Andes, *Cuming* (*n.* 177.); Baths of Collina, *Macrae.*—This seems to be a Cordillera plant, distinguishable from the following by its more downy leaves and stem, not in the least glutinous.

998. (21.) Diplopappus *Donianus* (Hook. et Arn.); fruticosus læviter pubescens subglutinosus, foliis lanceolatis coriaceis grosse acute dentatis in petiolum attenuatis, pedunculis elongatis bracteatis monocephalis, involucri villoso-pubescentis foliolis lineari-acuminatis exterioribus minoribus angustioribus, achenio sericeo, pappo testaceo. — Valparaiso, *Cuming* (*n.* 785.)—*β.* radio nullo. Valparaiso, *Cuming* (*n.* 786.), *Bridges.*—In this we can distinguish no ray to the flowers: the stems and leaves are much less downy than the preceding, but the upper part of the peduncle is more so.

999. (22.) Diplopappus *Pœppigianus* (Hook. et Arn.); fruticosus ubique tomentoso-sericeus, foliis lanceolatis acutis rigidiusculis inferne attenuatis omnino integerrimis, pedunculis elongatis bracteatis (demum glabris) monocephalis, involucri pubescenti-tomentosi foliolis lineari-subulatis exterioribus gradatim minoribus magisque subulatis, radio nullo, achenio sericeo, pappo testaceo. — Cordillera of Chili, *Cuming.* (*n.* 203.)

1000. (23.) Diplopappus *integerrimus* (Hook. et Arn.); fruticosus glaberrimus glutinosus dense foliosus, foliis lanceolatis acutis rigidis integerrimis inferne attenuatis, pedunculis elongatis remote bracteatis monocephalis, involucri glaberrimi viscidi foliolis subulatis apicibus recurvis exterioribus minoribus uniformibus, radio perbrevi, achenio sericeo, pappo testaceo.—San Felipe de Aconcagua, *Bridges* (*n.* 222.); Cordillera of Chili, *Cuming.* (*n.* 258.)—A very distinct and well-marked species.

1001. (24.) Diplopappus *glutinosus,* Pœpp.? fruticosus glaberrimus glutinosus, foliis obovato-lanceolatis subspathulatis coriaceis obtusis in petiolum attenuatis superne dentato-serratis, pedunculis elongatis subnudis monocephalis, involucri puberuli glutinosi foliolis arcte imbricatis lineari-subulatis exterioribus minoribus angustioribus, radio involucrum superante, achenio sericeo, pappo testaceo. — Valparaiso, *Bridges* (*n.* 225.); Cordillera of Chili, *Cuming.* (*n.* 285.)—Leaves almost exactly spathulate.

1002. (25.) Diplopappus *setiger* (Hook. et Arn.); fruticosus glaber glutinosus, foliis densis linearibus rigidis pinnatifidis segmentis rigido-setigeris, pedunculis elongatis multibracteatis bracteis subulatis setigeris, involucri pubescentis foliolis spinoso-setigeris subulatis intimis lineari-oblongis, radio obsoleto, achenio setigero, pappo fulvo.—Baths of Collina, *Macrae;* Questa de Chuenboco, *Bridges* (*n.* 221.); Chilian Andes, *Cuming* (*n.* 178.)

1003. (26.) Diplopappus *sericeus* (Less.); herbaceus glanduloso-pubescens vel sericeo-villosus subramosus, radice perenni, foliis radicalibus petiolatis lanceolato-spathulatis, caulinis lanceolatis sessilibus, involucri foliolis pauciseria-

libus pubescenti-glandulosis linearibus acutis intimis membranaceis margine coloratis, radio purpureo, achenio nervoso pubescente, pappo fulvo.—*Less. in Linnæa, v.* 6. *p.* 110.—D. candidus, *Gill. et Don, MSS.*—D. vestitus, *Gill. MSS.*—Near Valparaiso and Talca, *Dr. Gillies, Cuming* (*n.* 67.); Las Animas, near Valdivia, *Bridges* (*n.* 749.); Buenos Ayres and Pampas of Santa Fée, *Dr. Gillies;* Island of Los Morinheros, Entre Rios and North Patagonia, *Tweedie.*—β. *glandulosa;* caule foliisque minus villosis magis minusve glandulosis.—Aplopappus lividus. *Gill. et Don, MSS.*—Peral, Chili, *Dr. Gillies;* Sierras de San Isidro, Quillota, Chili, *Bridges.* (*n.* 299.)

1004. (27.) Diplopappus *diffusus* (Hook. et Arn.)—Erigeron diffusus. *Pers.*—El Morro. Prov. of St. Luis, *Dr. Gillies.*—This is more branched than the preceding, with smaller leaves and a much deeper (dark purple-brown) pappus. In this and all the preceding species of *Diplopappus,* the achenium is silky or hairy, both the rows of the pappus pilose, though the outer one be shorter than the inner: hence belonging to the genus or group of *Aplopappus* of Cassini.

1005. (28.) Diplopappus *pinnatifidus* (Hook. et Arn.); fruticosus glaberrimus glutinosus, foliis pinnatifidis, segmentis paucis elongatis subdistantibus anguste linearibus mucronatis, pedunculis elongatis parce foliosis monocephalis, involucri hemisphærici foliolis oblongis mucronatis, achenio glabro, pappi setis inæqualibus rigidis subcorneis serrulato-ciliatis.—Province of Maule, *Cuming* (*n.* 848.)—This has a very peculiar habit, with fleshy leaves, resembling some maritime species of *Senecio,* large capitula, with a white (?) ray and a singularly harsh and rigid pappus.

1006. (29.) Diplopappus *hispidus,* Gill.; perennis hispido-pilosus, caule herbaceo striato, foliis erectis lineari-oblongis linearibusve, pedunculis rariter foliosis monocephalis, involucri foliolis anguste linearibus acuminatis pilosis adpressis, ligulis anguste linearibus, acheniis scabris, pappo exteriore paleaceo 3—4-plo breviore.—Villavicenzio, El Rio Diamante, and Andes of Mendoza, *Dr. Gillies;* Las Loamas of Bahia Blanca in North Patagonia, Uraguay, and Banda Orientale, *Tweedie.*—This and the two next have quite a different habit from the others we have described: the ray likewise appears to consist of several rows, as in *Erigeron,* but the outer paleaceous pappus removes it entirely from that genus.

1007. (30.) Diplopappus *villosus* (Hook. et Arn.); annuus molliter villosus arcte foliosus superne ramosus, foliis lato-linearibus acutis integerrimis radicalibus spathulatis, pedunculis terminalibus foliosis monocephalis, involucri hirsuti foliolis pauciserialibus linearibus acutis ligulis angustis (albis), achenio sericeo, pappo exteriore anguste paleaceo.—Rio Grande do Sul, S. Brazil, *M. Isabelle.*—Similar in habit to the last, but smaller in all its parts, clothed with softer hairs, and decidedly an annual plant.

1008. (31.) Diplopappus *stenophyllus* (Hook. et Arn.); perennis? caule herbaceo dense folioso, foliis angustissime linearibus ciliatis, pedunculis nudiusculis monocephalis, involucri foliolis lineari-subulatis pilosis, ligulis angustis, acheniis scabris, pappo exteriore paleaceo 3—4-plo breviore. — Uraguay, *Tweedie.*—β. foliis minus ciliatis. Rio Grande, *Tweedie.*

1009. (32.) Diplopappus *pinifolius* (Hook. et Arn.); caule subherbaceo, foliis erectis filiformibus acutis glaberrimis, pedunculis nudiusculis monocephalis, involucri foliolis linearibus glabris.—Rio Grande, *Tweedie.*—Of this we possess but an imperfect specimen, but that has much the habit of the preceding species. The leaves, however, are short and filiform, quite glabrous.

1010. (33.) Diplopappus? *corymbosus* (Hook. et Arn.); perennis, caule herbaceo subsimplici, foliis lineari-lanceolatis erectis rigidiusculis acutis parce pilosis integerrimis subtus trinerviis, pedunculo terminali corymboso, involucri glabri foliolis pauciserialibus linearibus acutis albo-marginatis, radio nullo. — Rio Grande, *Tweedie.*—This differs somewhat in habit from all our other species of *Diplopappus,* especially in the corymbose inflorescence. The capitula are small. Pappus and achenia too young to be satisfactorily described.

1011. (1.) Aster *erigeroides* (Hook. et Arn.); ramosissimus glaber valde foliosus basi fruticosus, foliis lineari-lanceolatis membranaceis subtrinerviis acuminatis sessilibus inciso-serratis, paniculis corymbosis densis, involucri pubescentis foliolis pauciserialibus imbricatis lineari-subulatis exterioribus minoribus, radio subpluriseriali albo.—Juan Fernandez, in rocky places, *Douglas, Cuming.* (*n.* 1334.)—β. *proliferus;* foliis 3—4-plo majoribus inciso-subpinnatifidis, corym-

bis quasi lateralibus. Stony elevated woods, Juan Fernandez, *Bertero.*—This seems to have as much claim to a place in the genus *Erigeron* as in *Aster:* and in some flowers, the florets of the ray appear to be in more than one series.

1012. (2.) Aster *subulatus.* Mich.—A. inconspicuus. *Less. in Linn. v.* 5. *p.* 143. A. scorzonerifolius. *Less. Comp. p.* 182. Tripolium subulatum, *Nees. Ast. p.* 156. Erigeron dracunculoides, *Don, MSS.* E. flexuosus. *Gill.* Conyza graminifolia! *Spr. Syst. Veget. v.* 3. *p.* 515. Quillota and Valparaiso. *Bridges* (*n.* 183. 185.), *Cuming* (*n.* 654.); Monte Video, Buenos Ayres, Uraguay, North Patagonia, *Tweedie;* San Luis, *Dr. Gillies.*—A very variable plant; but in all our specimens the scales of the involucre are broader and less acuminated than in the original *A. subulatus* from N. America. It is probably a common plant on the sea-shore, and by the margins of salt lakes throughout the greater part of N. and S. America, both intra- and extra-tropical.

1013. (3.) Aster *Vahlii* (Hook. et Arn.); herbaceus glaberrimus pauce ramosus, foliis lineari-lanceolatis integerrimis obtusiusculis basi semiamplectantibus infimis spathulatis basi subvaginantibus subseriatis, capitulis solitariis, involucri pauciserialis foliolis glaberrimis imbricatis linearibus acutis, radio purpureo, pappo cinereo.—Erigeron Vahlii. *Gaudich. Ann. des S. Nat. v.* 5. *p.* 104. Diplopappus glabellus. *Gill. et Don, MSS.*—Andes of Chili, *Dr. Gillies;* Chiloe, *Cuming* (*n.* 55.); Valdivia, *Bridges* (*n.* 623.); Cape Negro, Straits of Magellan (*n.* 390.), and Falkland Islands (*n.* 389.), *C. Darwin, Esq.*—It was in this latter country that this species was first detected by Gaudichaud.

1014. (4.) Aster *Gilliesii* (Hook. et Arn.); piloso-scaber, caulibus erectis subramosis angulatis, foliis linearibus obtusis integerrimis obtusis basi sublonge attenuatus, pedunculis paucis terminalibus monocephalis, involucri hispido-strigosi foliolis pauciserialibus linearis acuminatis imbricatis, radio (purpureo) subuniseriali discum triplo superante, achenio strigoso, pappo fulvo. — Diplopappus elongatus. *Gill. et Don, MSS.*—Quebrado de Rios, Andes of Chili and Mendoza. *Dr. Gillies.*

1015. (1.) Sommerfeldtia *spinulosa,* Less. *Compos. p.* 190.—Conyza spinulosa, *Spreng.*—Rio Grande, *Tweedie.* Microgyne *trifurcata.* Less. *Comp. p.* 190.—Erigeron trifurcatus. *Gill. et Don, MSS.*—Pampas of Buenos Ayres, Rio Saladillo, *Dr. Gillies.* Buenos Ayres, Maldonado and N. Patagonia, *Tweedie.*

1016. (1.) Erigeron *Canadensis,* L.—E. sordidus, *Don et Gill. MSS.*—Valparaiso, *Dr. Gillies, Cuming* (*n.* 1435.), *Bridges* (*n.* 188.); Buenos Ayres, *Dr. Gillies;* Uraguay and N. Patagonia, *Tweedie;* Cape Negro, Straits of Magellan, *C. Darwin, Esq.*—Valparaiso. (*n.* 387.) of *Cuming* has the ligula of the ray about one-fourth the length of the tube, while in the others it is scarcely one-sixth.

1017. (2.) Erigeron *spiculosus* (Hook. et Arn.), *Bot. of Beech. Voy. p.* 32.—Chilian Andes, *Cuming* (*n.* 159, 160, and 227.) Valdivia (*n.* 504.); *α.* Valparaiso, *Bridges* (*n.* 184. 186.), *Cuming.* (*n.* 432 and 407.)—*β. glabellus.* Port Gregory, Patagonia (*Herb. nostr.*).—A most variable plant, nearly allied to the preceding, but having the capitula twice as large, and forming a broad terminal panicle. The leaves are sometimes entire, sometimes serrated and even sinuated, the ligule of the ray is sometimes short, about one-sixth the length of the tube, at other times it occupies about one-half the length of the floret: but their diversities do not appear to be accompanied by other distinguishing characters. The short form of the ligula belongs to our *Conyza ambigua,* Hook. et Arn. *in Bot. of Beech. Voy. p.* 32.

1018. (3.) Erigeron *stenophyllus* (Hook. et Arn.); suffruticosus, radice crassa fusiformi lignosa multicipite, caulibus foliisque cano-pubescentibus, his angustissime linearibus obtusiusculis integerrimis, involucri foliolis linearibus acuminatis interioribus majoribus membranaceis coloratis, achenio parce strigoso.—*α.* radio perbrevi, caulibus vix angulatis.—Valparaiso, *Cuming* (*n* 74.), *Bridges* (*n.* 182.).—*β*? radio discum duplo superante, caulibus angulatis, minus pubescentibus. — Valparaiso, *Dr. Gillies, Cuming* (*n.* 406.) — Our var. *α.* approaches very closely to the next species, but the root is of a more woody nature, the stems shorter, more slender, but more wiry and harder, and the pubescence more minute, but more copious and white. Of our var. *β.* we have not seen the root: it is a much taller plant, and is probably a distinct species.

1019. (4.) Erigeron *strictus* (Hook. et Arn.); herbaceus perennis pubescens,

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caulibus usque ad florescentiam simplicibus angulatis, foliis inferioribus lineari-lanceolatis basi longe attenuatis serratis, superioribus angusto-linearibus acutis integerrimis, involucri foliolis linearibus acuminatis interioribus majoribus membranaceo-marginatis, radio perbrevi, achenio parce strigoso.—Valparaiso, *Cuming.* (*n.* 589.) Juan Fernandez, *Dr. Scouler.*

1020. (5.) Erigeron *canescens* (Hook. et Arn.); cano-pubescens, caulibus virgatis usque ad florescentiam simplicibus, foliis anguste spathulato-linearibus inferioribus paucidentatis superioribus integerrimis apiculatis, involucri foliolis linearibus acuminatis interioribus longioribus submembranaceis coloratis, radio (albo) discum duplo superante, achenio strigoso.—Valparaiso, *Cuming.* (*n.* 75.)

1021. (6.) Erigeron *cinereus* (Hook. et Arn.); piloso-hispidus, caule brevi decumbente 1—3—5-cephalo, foliis integerrimis radicalibus spathulatis caulinis lineari-lanceolatis, involucri tomentoso-hirsuti foliolis imbricatis pauciserialibus linearibus acutis subæqualibus, radio discum duplo superante, achenio pappi longitudine compresso-ancipiti glaberrimo, pappi subbiserialis serie exteriore brevissimo. — Diplopappus cinereus. *Don et Gill. MSS.*—*α.* caule 2—5-cephalo. Los Palomares, Andes of Mendoza, *Dr. Gillies.*—*β.* caule monocephalo, involucro colorato. San Pedro Nolasco, Andes of Chili, *Dr. Gillies.*

1022. (7.) Erigeron *uniflorus,* Linn.—E. myosotoides? *Juss.*—Diplopappus bellidioides, *Gill. et Don, MSS.*—Quebrado de Rios, Andes of Chili, *Dr. Gillies.*—*β.* foliis glabris (petiolis ciliatis exceptis) involucrique colorati foliolis nudiusculis. Cordillera of Chili, *Cuming.* (*n.* 195.)—Strange as it may appear, we are quite unable to distinguish this plant from the Europæan *E. uniflorum.* The achenium is slightly hirsute, short in proportion to the length of the pappus, by which characters it is chiefly distinguished from the preceding.

1023. (8.) Erigeron *othonnæfolius* (Hook. et Arn.); ubique densissime piloso-pannosus, caule brevi erecto monocephalo, foliis omnibus spathulatis integerrimis, superioribus sensim minoribus, involucri foliolis linearibus acutis pannosis, radio (albo) discum vix duplo superante.—Maule Province, *Cuming* (*n.* 831.)—Our specimens of this appear to be truly distinct from the two preceding, in the densely matted covering of hairs on the stem and foliage.

[Allied to the three last are the following specimens of *Erigeron* in our Herbarium:—1, caule ramoso polycephalo. from Patagonia—2, caule bifloro simplici. Cape Negro, Straits of Magellan, *C. Darwin, Esq.* (*n.* 394.)—3, radice tenui elongato, caule gracili 1—2-floro foliis elongatis. Gregory Bay, Straits of Magellan. *C. Darwin, Esq.* (*n.* 385.): all are too imperfect to describe from.]

1024. (9.) Erigeron *Tweediei* (Hook. et Arn.); caule erecto elongato striato glabro, foliis remotis oblongo-acuminatis basi cordatis amplexantibus glanduloso-punctatis integerrimis marginibus callosis denticulato-ciliatis, paniculis terminalibus paucifloris glomeratis, pedicellis pilosis, involucri foliolis oblongo-linearibus exterioribus ciliatis, radio brevi (flavo), pappo rufo-fulvo.—Maldonado, in boggy ground. *Tweedie.* (*n.* 1058.)—A very fine and remarkable plant, one and a half to two feet high, and the leaves four to five inches long: the flowers yellow, those of the disk marked with purple lines.

PODOPAPPUS. *Hook. et Arn.*

Involucrum imbricatum, foliolis angustissimis linearibus acuminatis. *Capitulum* heterogamum: *flores fœm.* pluriseriales in ambitu, corollis tenuibus ligulas angustas gerentibus; *reliqui* hermaphroditi. *Antheræ* ecaudatæ. *Rachis* ebracteolata. *Achenium* oblongum compressum margine incrassatum, rostro tenui longiusculo instructum. *Pappus* pilosus pluriserialis.—Herbæ *simpliciusculæ.* Folia *alterna.*—Forsan idem genus ac *Podocoma,* Cass. (cui certe valde affine, quam propter nomen affine datur), at illi, secundum Lessingium, radius uniserialis.

1025. (1.) P. *hirsutus* (Hook. et Arn.); hirsuto-pilosus, caule subsimplici, foliis inferioribus (magnis) elliptico-oblongis sinuato-dentatis, superioribus amplectantibus valde decrescentibus angustioribus, summis integerrimis, capitulis corymboso-racemosis, pedicellis capitulo subbrevioribus, involucro glabriusculo, radio 4—6-seriali involucrum vix superante.—Rio Grande, and Guardia Argentino in North Patagonia; *Tweedie.*

1026. (2.) P. *pubescens* (Hook. et Arn.); hispido-pubescens, caule versus apicem ramoso, foliis caulinis oblongis vel cordato-ovatis sessilibus integerrimis, rame-

alibus sursum decrescentibus et angustioribus, capitulis corymbosis pedicellis inferioribus capitulo triplo longioribus, involucro pubescente, radio biseriali involucrum longe superante. — Buenos Ayres, *Tweedie*.

1027. (3.) P. *tomentosus* (Hook. et Arn.); foliis dense approximatis linearibus sessilibus et involucro albide lanato-tomentosis, capitulis (magnis) solitariis, radio involucrum duplo superante.—Province of Rio Grande do Sul; *M. Isabelle*.—It is impossible for us to say whether our specimen be a branch of a large plant, or whether the stem be one-flowered. The flowers are fully two inches across, while in the two preceding they are scarcely so large as in *Conyza Chilensis*.

1028. (1.) Lepidophyllum *cupressiforme* Cass. *Dict. Sc. Nat. v.* 26. *p.* 37, Less. *Comp. p.* 191.—Baccharis cupressiformis, *Pers.* — Conyza cupressiformis, *Lam.*—Port Desire, *C. Darwin, Esq.* (*n.* 323.)

1029. (1.) Gutierrezia *linearifolia* (Lag.); foliis linearibus planiusculis, capitulis turbinatis 5—10-radiatis, pappi paleis lineari-elongatis acutis.—α. foliis angustis papilloso-scabris. — Galinsogea? resinosa. *Hook. et Arn. in Bot. Beech. Voy. p.* 32.—Villa Vicenzio, Andes of Mendoza, *Dr. Gillies*; Valparaiso, *Cuming*, (*n.* 71); Coquimbo, *Messrs. Lay and Collie*.—β. foliis angustis lævibus.—Aguadite, prov. of San Luis, *Dr. Gillies*.—γ. foliis latioribus subtrinerviis papilloso-scabris.—Los Tolditas, El Guindo, and Los Chacaes, Andes of Mendoza, *Dr. Gillies*; East Coast of Patagonia, *Dr. Eights*; Port Desire, *C. Darwin, Esq.* (*n.* 319.)

"*Planta* suffruticosa. *Caulis* spithamæus vel pedalis, gracilis, flexuosus, plerumque ramosissima. *Rami* angulati, scabri, viminei. *Folia* sparsa, linearia, mucronulata, impresso-punctata, sæpius papilloso-scabra, supra canaliculata, pollicaria; superiora subulata. *Capitula* laxe corymbosa, paniculata, turbinata, unguicularia. *Pedunculi* angulati, scabri, bracteis subulatis subadpressis ornati. *Involucrum* multiplici ordine polyphyllum, imbricatum: *foliolis* ovato-oblongis, recurvato-mucronatis, cartilaginis, margine scariosis, ciliatis. *Rachis* haud favosum, ebracteolatum. *Corollæ radii* 5—10, elliptico-oblongæ, cartilagineæ, rigidæ, femineæ: *disci* 8—12, infundibuliformes, 5-dentatæ, hermaphroditæ, 5-dentatæ, dentibus ovatis, recurvatis, glabris. *Filamenta* complanata, glabra, gracilia. *Antheræ* in tubum coalitæ, semiexsertæ, basi muticæ, appendicula ovata acutiuscula membranacea coronatæ. *Styli* hermaphroditorum rami lineares, obtusi, dense papillosi, exappendiculati; femineorum lineari-lingulati, obtusi, læves. *Achenia* cuneata, angulata, pilosa. *Pappi* radii paleacei, lineares, acuti, biseriales, apice eroso-denticulati." *Don. in litt.*

1030 (2.) Gutierrezia *laricifolia* (Don,); foliis lineari-angustissimis canaliculatis, capitulis globosis multiradiatis, involucri foliolis subulato-acuminatis, pappi paleis truncatis brevissimis.—Coquimbo, *Mr. Caldcleugh*.

"*Planta* suffruticosa, erecta, glutinosa, sesqui-v. bipedalis. *Caulis* dense foliosus, corymboso-ramosissimus. *Rami* numerosi, elongati, plerumque monocephali. *Folia* anguste linearia, mucronulata, canaliculata, patentia, 1—2-pollicaria. *Capitula* triplo majora quam in præcedente, globosa, multi- (30—40)-flora. *Involucri foliola* scariosa, apice elongato-subulata, recurvo-patentia. *Receptaculum* breviter paleaceo-fimbrilliferum. *Radii* copiosi, ligulati, revoluti, aurei? *Achenia* angulata, sericea. *Pappus* polyphyllus, brevissimus, truncatus." *Don, in litt.*—This we have not seen, nor does Mr. Don state whether the pappus consists of one or two rows of paleæ. *Brachyris* of Nuttall has much of the character of this genus, and appears to differ only by the pappus being in a single row.

1031. (1.) Lagenophora *Commersonii*, Cass. *Dict. Sc. Nat. v.* 25. *p.* 160; *Less. Compos. p.* 193.—Calendula pumila, *Frost.* —C. magellanica, *Willd.*—Cape Horn, *Dr. Eights*.—β. *hirsuta*; foliis hirsutis —L. hirsuta, *Less.? in Linn. v.* 6. *p.* 131. —Cape Horn, *C. Darwin, Esq.* (*n.* 316.) —We are doubtful about Lessing's *L. hirsuta*, as he says that the whole plant is hirsute, while in our β, the peduncle is glabrous as in α; this variety being thus intermediate between the two South American species.

1032. (1.) *Madia viscosa*, Cav.—M. mellosa, *Mol.*—Province of San Luis, *Dr. Gillies*; Valparaiso, *Dr. Gillies*, *Cuming*, (*n.* 409, 410.) *Bridges*; Conception, *Mr. Caldcleugh*; Antuco, *Mr. Reynolds*.—*M. stellata*, Fisch. and Mey. Ind. Sem. Petrop. p. 32, appears to be the same species. If *M. sativa*, Mol., of which Cassini has constituted his genus *Biotia*, be distinct, we are unacquainted with it.

1033. (1.) Crinitaria *Linosyris*, Less.—Buenos Ayres, *Tweedie*; (perhaps cultivated.)

1034. (1. Kleinia *Porophyllum*, Willd.—Rio Grande, Rio Parana, St. Catherine's, and woods of Tucuman, *Tweedie* (*n.* 1163.)

1035. (2.) Kleinia *linifolia* (Gill. et Don,); suffruticosa erecta ramosissima glauca, ramis virgatis, foliis remotiusculis linearibus calloso-mucronatis carnosis, involucri foliolis mucronatis pappum subæquantibus acheniis subhirsutis. — Rio Quarto, Provinces of Cordova, and Jarillal, Mendoza, *Dr. Gillies;* Rio Grande, *Tweedie.*—Perhaps this may prove to be *K. obscura*, Spr., but the description differs in several particulars.

1036. (3.) Kleinia *filifolia* (Spr. ?); suffruticosa erecta ramosissima glauca, ramis virgatis, foliis crebriusculis angustissimis subfoliformibus, pedunculis subgeminis, involucri foliolis oblongis submucronatis pappum dimidium attingentibus, acheniis subhirsutis.—Island of Los Morinheros of Rio Grande, *Tweedie.*—The leaves of our plant are not fascicled, hence arise our doubts as to whether Sprengel's plant may not be distinct.

1037. (4.) Kleinia *exserta* (Hook. et Arn.); suffruticosa erectiuscula ramosissima glauca, ramis virgatis, foliis crebriusculis angustissimis subfiliformibus, pedunculis geminis, involucri foliolis cuneato-oblongis obtusis achenia hirsutula æquantibus.—Fields and hedge-sides of Portalegre, *Tweedie.*—Readily distinguished from the last by the short and proportionally broader leaflets of the involucre.

1038. 5.) Kleinia *pumila* (Hook. et Arn.); suffruticosa adscendens multicaulis glauca, ramis simpliciusculis, foliis crebris linearibus vel subfiliformibus, pedunculis solitariis elongatis, involucri foliolis mucronulatis pappum æquantibus, acheniis hirsutulis.—*α.* foliis elongatis; Monte Video, *Tweedie.*—*β.* foliis abbreviatis; Parana and Buenos Ayres, *Tweedie.*

1039. (6.) Kleinia *brevifolia* (Hook. et Arn.); suffruticosa diffusa ramosissima valde glauca, ramis flexuosis, foliis spathulato-linearibus mucronatis, pedunculis solitariis, involucri foliolis mucronulatis pappum dimidium superantibus, acheniis hirsutulis.—Rocky point of Gorrita on the coast of Maldonado, *Tweedie.*

(*To be continued.*)

ILLUSTRATIONS OF INDIAN BOTANY; PRINCIPALLY OF THE SOUTHERN PARTS OF THE PENINSULA.

By R. Wight, M. D. F.L.S. & G. A. W. Arnott, Esq., &c.

(*Continued from p. 228, Vol. I.*)

Oxystelma *esculentum;* foliis lineari-lanceolatis venosis, corolla margine ciliata, folliculis oblongis acuminatis. (Tab. XXIV.) *Roem. et Sch. Syst. Veget.* 6. *p.* 89. *Spreng. Syst. Veget. p.* 850. *Wall. Asclep. n.* 94. *Wight, Cat. n.* 1547. *Wight, Contrib. to the Bot. of Ind. p.* 54.

Periploca esculenta. *Linn. fil. Suppl. p.* 168. *Willd. Sp. Pl. v.* 1. *p.* 1250. *Roxb. Cor. v.* 1. *p.* 13. *t.* 14.

Asclepias rosea. *Roxb. Fl. Ind. v.* 2. *p.* 40. *Pluk. t.* 359. *f.* 6.

Root fibrous. *Stems* filiform, round, smooth, green, voluble. *Leaves* shortly petioled, opposite, linear-lanceolate, acute, rounded and subcordate at the base, entire, smooth, deep green above, paler and veined beneath, deciduous? from two to three inches long, by about half an inch broad. *Racemes* axillary, long-peduncled, bearing from three to eight large, subcampanulate, five-cleft *flowers;* their segments triangular, acute, externally of a pale rosy hue, internally purplish, marked with darker lines. *Column of fructification* prominent; crown of five inflated leaves, broad, and somewhat compressed at the base, tapering to a sharp incurved point. *Anthers* terminated by a membrane. *Pollen-masses* compressed, attached by their attenuated apex, pendulous. *Stigma* large, flat, covered on the edges by the membranous lips of the anthers. *Pericarps* two, large, inflated *follicles:* these consist of two coats or layers, loosely attached to each other, and it is between these that the inflation takes place, as the inner coat is of a firm texture, and closely embraces the *seeds,* which are numerous and comose.

This plant always grows near water, or even with its roots in water; its stems twining round whatever support they can

find. It is common in the highly irrigated country of Tanjore; and when seen in great luxuriance and in full blow, is truly a beautiful object. It flowers during the rainy and cool seasons.

In decoction, it is used as a gargle, for aphthous affections of the mouth and fauces, but never as an esculent in this part of the country.

Fig. 1. Flower, from which the corolla has been removed. 2. Column; the staminal crown being removed. 3. Pistil:—*magnified.*

(To be continued.)

OBSERVATIONS ON SOME NEW, OR LITTLE KNOWN GENERA AND SPECIES OF SCROPHULARIACEÆ.

By George Bentham, Esq., F.L.S.

I. Phygelius. *E. Meyer.*

Tribus Digitalearum.

Calyx 5-sepalus. *Corolla* tubulosa, tubo declinato apice recurvo-adscendente dilatato, limbo brevi 5-fido subbilabiato, laciniis planis rotundatis. *Stamina* 4, didynama, declinata. *Antheræ* biloculares, loculis parallelis muticis adnatis. *Stylus* simplex, stigmate parum incrassato. *Capsula* obliqua, bilocularis, septicidè bivalvis. *Semina* exalata, albuminosa.

1. *P. capensis*, E. Meyer, MSS.—Frutex glaberrimus rhachi paniculæ tenuiter pubescente exceptâ. Folia opposita, petiolata, (fere *Teediæ*) ovata, subcordata, crenata, crassiuscula, lævia. Panicula ultrapedalis, laxa, secunda, ramis laxe 3—5-floris. Bracteæ ad basin ramorum paniculæ et pedicellorum breves. Pedicelli apice recurvi. Calyces nutantes, glaberrimi. Corolla sesquipollicaris, speciosa, glaberrima, tubo supra ovarium contracto. Stamina exserta. Capsula ovata, semipollicaris, valde obliqua, submembranacea, bisulcata, glaberrima, glaucescens.

Hab. South Africa: on the Witbergen in Cafferland, *Drège.* (*v. s.*)

This is a very handsome shrub. The panicle and flowers are nearly those of some of the larger *Pentstemons.*

II. Colpias. *E. Meyer.*

Tribus Digitalearum.

Calyx 5-sepalus. *Corolla* tubo brevi amplo, basi saccato-declinato, apice adscendente, limbo 5-fido subbilabiato, laciniis rotundatis planis. *Stamina* 4, didynama, declinata. *Antheræ* biloculares, loculis divaricatis demum confluentibus. *Stylus* brevissime emarginatus stigmatibus parvis. *Capsula* bilocularis, valvulis coriaceis, septicidè dehiscentibus apice bifidis.

1. *C. mollis*, E. Mey. MSS.—Fruticulus divaricato-ramosissimus, ramis fragillimis molliter pilosis. Folia petiolata, subrotundo-cordata semipollicaria, acuta, inciso-dentata vel palmatiloba, utrinque pilosa. Pedunculi axillares uniflori folio longiores ebracteati. Calyx villosissimus. Corolla 8—10 lin. longa glaberrima. Genitalia brevissima. Capsula glabra, calycem æquans.

Hab. South Africa: On rocks near Zilverfontein in Namaqualand. *Drège.*

This plant has some resemblance to some of the yellow-flowered *Scrophulariæ* and forms perhaps the connection between that genus and the *Digitaleæ.*

III. Ixianthes.

Tribus Digitalearum.

Calycis sepala 2—3 superiora fere ad apicem connata, 2 inferiora libera. *Corolla* tubo amplo declinato apice subadscendente, limbo 5-fido laciniis planis. *Stamina* 4? declinata. *Antheræ* biloculares, loculis crassis divaricatis. *Stylus* brevissime emarginatus. *Capsula* bilocularis, valvulis coriaceis septicidè dehiscentibus apice subbifidis.

1. *I. retzioides.*—Frutex ramis erectis hirsutis. Folia crebra, 4—5-natim verticillata, subsessilia, erecta, rigida, lanceolata, acuta, apice serrata, basi angustata, integerrima, coriacea, glabra, vel juniora villosa. Pedunculi axillares, uniflori, bibracteati, folio breviores. *Calyx* 4—5-lin. longus, sepalis striatis glabriusculis. Corolla circiter 10 lin. longa valde obliqua, extus viscoso-villosa. Genitalia corolla breviora. Capsula crassa, semipollicaris, ovoidea, acuta, profunde bisulcata, matura bipartibilis.

HAB. South Africa: near Tulbagh in Worcester district, *Ecklon.* (*v. s.*)

A very remarkable plant, certainly very distinct from any other genus known, although I have not been able to ascertain very precisely the form of the corolla or the number of stamina.

Paulownia Zuccarini, and *Rehmannia* Fisch. et Mey. belong to the Digitaleæ.

IV. HALLERIA. *Linn.*

TRIBUS GRATIOLEARUM.

Calyx late campanulatus, lobis 3—5-latis foliaceis. *Corolla* tubulosa, apice dilatata, limbo obliquo, lobis 5 brevibus latis planis. *Stamina* adscendentia, didynama, antheris bilocularibus, loculis parallelis subbilobis explanatis. *Stylus* subsimplex, stigmate minimo. *Bacca* bilocularis.—Frutices *Austro-Africani glabri.* Folia *perennantia, opposita, ovata, supra lævia.* Pedicelli *axillares, solitarii vel fasciculati, bibracteati.* Calyces *breves, virides, subenervii.* Corollæ *et genitalia glabra.*

1. *H. lucida* (Linn. Spec. 872) foliis petiolatis ovatis acuminatis serrato-crenatis basi cuneatis, calycibus trilobis, corollæ incurvæ limbo valde obliquo.

HAB. Cape of Good Hope. (*v. s.*)

2. *H. ovata*, foliis petiolatis ovatis crenatis basi rotundatis truncatisve, calycibus quinque-lobis, corollæ rectiusculæ limbo vix obliquo.

HAB. Clanwilliam district, *Ecklon.* (*v. s.*)

3. *H. elliptica* (Linn. Spec. 872) foliis brevissime petiolatis ovato-ellipticis argute serratis basi cuneatis, calycibus quadrilobis, corollæ rectiusculæ limbo subæquali.

HAB. Cape of Good Hope. (*v. s.*)

This species which occurs the most frequently in Cape collections, answers precisely to Thunberg's description, but the calyx has four and not five divisions as in the Linnæan phrase.

V. TEEDIA. *Rudolph.*

TRIBUS GRATIOLEARUM.

Calyx 5-partitus. *Corolla* tubulosa, limbo 5-fido subbilabiato, laciniis planis. *Stamina* 4, didynama, inclusa. *Antheræ* biloculares loculis parallelis. *Stylus* brevis, stigmate capitato. *Bacca* bilocularis indehiscens. Frutices *Austro-Africani.* Folia *opposita.* Pedunculi *axillares vel terminales triflori.*

1. *T. lucida* (Rud.) foliis ovato-ellipticis basi angustatis caulem dilatato-amplectantibus, caule calycibusque glaberrimis.

Capraria lucida.

β. parvifolia.

HAB. Mountains of the Cape, Stellenbosch and Swellendam districts, *Ecklon, Drège, &c.* *β.* on the Camiesbergen, *Drège.* (*v. s.*)

2. *T. pubescens* (Burch. Trav.) foliis ovato-ellipticis basi angustatis et caulem dilatato-amplectantibus, caule calycibusque villosis.

HAB. On the Keureboom river, *Drège.* (*v. s.*)

There is in Ecklon's collection a small specimen without any flower, of what appears to be a third species, slightly pubescent, petioles not dilated at the base.

VI. ANASTRABE. *E. Meyer.*

TRIBUS GRATIOLEARUM?

Calyx campanulatus semi-5-fidus. *Corolla* tubo brevi, limbo bilabiato, labio superiore bifido laciniis planis, inferiore maximo declinato saccato apice brevissime trifido. *Stamina* 4, didynama, adscendentia. *Antherarum* loculi paralleli vel divergentes. *Stylus* apice truncatus vel brevissime bifidus, stigmatibus minutis. *Capsula* oblonga, coriacea, bilocularis, valvulis septicide dehiscentibus bifidis. *Semina* pauca, testa membranacea reticulata. *Albumen* cartilagineo-carnosum. Frutices *Austro-Africani.* Folia *opposita breviter petiolata, oblongo-elliptica, supra nitida glabra, subtùs incana.* Flores *in corymbis cymisve axillaribus terminalibusque foliis plerumque brevioribus dispositi.* Calyces *et* corollæ *extus tomentosæ.*

1. *A. integerrima* (E. Mey. MSS.), foliis integerrimis, capsulis calyce duplo longioribus.

HAB. Amaponda country, *Drège.* (*v. s.*)

2. *A. serrulata* (E. Mey. MSS.), foliis argute serrulatis, capsulis calyce vix longioribus.

HAB. Amaponda country, *Drège. (v. s.)*

These two species, which are very much alike, come near to *Freylinia* and to *Buddleia* in habit. Their characters are in some measure intermediate between those of the *Gratioleæ* and *Hemimerideæ*.

VII. FREYLINIA, *Colla*.

TRIBUS GRATIOLEARUM.

Calyx 5-sepalus, sepalis submarginatis. *Corolla* tubulosa, limbo 5-lobo subbilabiato, laciniis rotundatis planis. *Stamina* didynama. Antheræ biloculares, loculis parallelis contiguis. *Stylus* simplex, stigmate incrassato-capitato. *Capsula* ovata vel oblonga, valvulis coriaceis septicide dehiscentibus apice bifidis.—Frutices *Austro-Africani*. Folia *opposita, vel sparsa, integerrima, coriacea, nitida*. Flores *in paniculas vel racemos terminales dispositi*. Bracteæ *ad basin ramorum paniculæ vel pedicellorum minutæ*.

Very near *Capraria* in characters, but very different in habit.

1. *F. cestroides* (Colla), foliis oppositis lanceolatis planis utrinque longe angustatis, floribus paniculato-racemosis.

Capraria lanceolata. *Linn. Suppl.* 284. *Link et Otto, Ic. Pl. Hort. Berol.* 11. *t.* 4.

Buddleia integerrima. *Herb. de l'Amat.*

HAB. Stellenbosch and Cape mountains; *Ecklon, Drège, &c. (v. s.)*

2. *F. densiflora*, foliis inferioribus verticillatis, superioribus sparsis oblongo-ellipticis subplanis glabris, racemo denso subpaniculato, corollis calyce 3—4-plo longioribus.

HAB. Swellendam, George, and Uitenage districts, *Ecklon, Drège. (v. s.)*

3. *F. longiflora* foliis oppositis sparsisve oblongo-ellipticis vix undulatis glabris, racemo elongato simplici, corollis calyce 5-plo longioribus.

HAB. Zwarteberg, *Ecklon. (v. s.)*

4. *F. undulata*, foliis ovatis, racemis brevibus subsimplicibus, corollis calyce subtriplo longioribus.

Capraria undulata.

α. *carinata*, foliis subplanis glabris carinatis.

β. *undulata*, foliis glabris undulatis.

γ. *pubescens*, foliis pubescentibus sæpe undulatis.

HAB. α. Langekloof and Zwartebergen, *Drège;* β. and γ. Swellendam district, *Ecklon, Drège. (v. s.)*

VIII. HERPESTIS. *Gærtn.*

TRIBUS GRATIOLEARUM.

There are several genera, which, like Herpestis, have the sepals unequal in breadth, and placed as it were in three rows; that is to say, the upper and external one is the broadest, the lower ones intermediate in breadth and situation, and the lateral ones are the innermost and the narrowest. Amongst these genera, *Beyrichia* and *Gratiola* are distinguished from *Herpestis*, by having but two fertile stamina, *Pterostigma*, by the disjoined cells of the anthers, and *Mecardonia* (from Martius's account,) and *Lindernia* have the valves of the capsule quite entire, the margins not inflexed, and a thin plane parallel dissepiment, characters which distinguish a small group among the *Gratioleæ*, containing besides these two genera five or six others.

There remain *Matourea, Caconapea*, and *Ranaria*. I had considered the first distinct in the dehiscence of the capsule, and *Caconapea* in the form of the corolla; but, on examining a number of species which I now possess, I find that these distinctions will not hold out; and *Ranaria*, which I have not seen, has, according to its author, the habit of *Caconapea*, with characters scarcely distinguishable from *Herpestis;* I have, therefore, thought it more conformable to a natural arrangement to consider the whole as one genus.

On the other hand, the plant, which, in my Scrophularineæ Indicæ, I had published as *Herpestis amara*, appears to be the *Curanga amara* of Jussieu, and to be really generically different from Herpestis. The calyx is described as four-sepaled, by Jussieu and Blume, as well as by Roxburgh.

Martius (Nov. Gen. et Sp. 3. 18.) separated the *H. lanigera*, Cham. et Schlecht., from the other species, on account of a disk, bordered with long teeth, and encircling the ovarium. I find in Sir W.

Hooker's Herbarium a Brazilian plant, which answers precisely to the description in the Linnæa, in which I cannot find this disk; yet Martius's observations are so accurate, that, although Chamisso and Schlechtendal make no mention of it, I cannot but suppose some inattention on my part, in examining the single flower I have been able to dissect. However this may be, the plant itself is in every other respect so very similar to other species of *Herpestis* that it does not seem advisable to consider it as a distinct genus.

The presence or absence of the bractes in *Herpestis* is not constant enough in many cases even in the same species to be used as a sectional distinction, as has been done by several Botanists.

I now give an enumeration of the species known with short characters of such as I have seen.

SEC. 1. *Matourea.* Corollæ labium superius integrum vel emarginatum. Capsulæ valvulæ integræ vel breviter bifidæ, marginibus inflexis.

1. *H. ovata* (Wall. Benth. Scroph. Ind. 30.), glabra, procumbens, foliis petiolatis ovatis crenatis, floribus subsessilibus solitariis oppositis bibracteatis, sepalo externo latissimo cordato.

HAB. Tavoy, *Wallich.* (*v. s.*)

2. *H. grandiflora,* glabra, foliis ovatis cordato-amplexicaulibus dentatis, pedicellis solitariis folia subæquantibus ebracteatis, sepalo externo ovato.

HAB. Rio Grande, *Tweedie.* (*v. s.*)

Calyx half an inch long.

3. *H. chamædryoides* (Humb. et Kunth. Nov. Gen. et Sp. 2. 369), glabra, decumbens, foliis breviter petiolatis ovatis dentatis, pedicellis solitariis folium æquantibus vel parum longioribus ebracteatis, sepalo externo ovato.

H. chrysantha, *Cham. et Schlecht. Linnæa,* 2. 577.

H. cubensis, *Pœpp. in Spreng. Syst.* 2. 802?

H. colubrina, *Humb. et Kunth Nov. Gen. et Sp.* 2. 368 *teste Chamisso.*

Lindernia dianthera, *Sw. Fl. Ind. Occ.* 2. 1058.

HAB. Central America: Texas, *Drummond;* Mexico, *G. I. Graham, &c.;* Antigua, *Nicholson;* Trinidad, *Lockhart;* Cuba, *Pœppig*? Quito and Guancacamba in Peru, *Humboldt and Bonpland.* (*v. s.*)

4. *H. tenella* (Cham. et Schlecht. Linnæa, 2. 576), glabra, prostrata, foliis breviter petiolatis ovatis dentatis, pedunculis solitariis (alternis) folio pluries longioribus ebracteatis, sepalo externo lato cordato.

HAB. South Brasil, *Sello;* Rio Grande Uruguay and Monte Video, *Tweedie.* (*v. s.*)

5. *H. caprarioides* (Humb. et Kunth. Nov. Gen. et Sp. 2. 368).

HAB. On the river Magdalena, *Humboldt and Bonpland.*

6. *H. herniarioides* (Cham. Linnæa 8. 34).

HAB. Brasil, *Sello.*

7. *H. flagellaris* (Cham. et Schl. l. c. 2. 575.), procumbens, glabra, foliis ovato-oblongis paucidentatis basi in petiolum brevem angustatis, pedicellis solitariis folio subduplo longioribus bracteatis, sepalo externo ovato-oblongo.

HAB. Banda Oriental, *Tweedie.* (*v. s.*)

8. *H. radicata,* glabra, prostrata, foliis oblongis subdentatis basi in petiolum angustatis, pedicellis folio vix longioribus ebracteatis, sepalo externo lato-ovato.

HAB. Port Desire in Patagonia, *Captain Middleton.* (*v. s.*)

Very near *H. oblonga* but scarcely dries black. It is a smaller plant and much more prostrate.

9. *H. peduncularis,* glabra, basi procumbens ramis floriferis erectis, foliis ovatis oblongisve serratis basi in petiolum brevem angustatis, pedunculis folio multoties longioribus solitariis ebracteatis, sepalo externo maximo ovato.

HAB. Texas on the Rio Brazos, *Drummond.* (*v. s.*)

10. *H. nigrescens,* glabra, erecta, foliis oblongis serrato-crenatis basi longe angustatis, pedunculis folio subæqualibus vel supremis longioribus ebracteatis, sepalo externo oblongo.

Gerardia cuneifolia, *Pursh, Fl. Amer. Sept.* 2. 422.

Gratiola acuminata, *Ell. Bot. of S. Car. and Georg. non Pursh.*

Matourea nigrescens, *Benth. Comp. Bot. Mag.* 1. 173.

Hab. Southern States of North America from Carolina, *Elliott*, to Texas, *Drummond.* (*v. s.*)

11. *H. pratensis.*

Matourea pratensis. *Aubl. Pl. Guy.*

Vandellia pratensis. *Vahl.*

Hab. Guiana, *Aublet.*

12. *H. pilosa*, erecta, viscosa, mollissime piloso-lanata, foliis sessilibus oblongis subintegerrimis, pedunculis folio brevioribus solitariis ebracteatis, sepalo externo lato-ovato.

Hab. North California, *Douglas.* (*v. s.*)

I am not quite certain as to the dehiscence of the capsule in this very distinct species.

13. *H. vandellioides.* (Humb. et Kunth. Nov. Gen. et Sp. 2. 367.)

Hab. Mexico *Humboldt and Bonpland.*

14. *H. callitrichoides.* (Humb. et Kunth. l. c.)

Morgania callitrichoides, Spreng. *Syst.* 2. 803.

Hab. Near San Fernando de Apure, *Humboldt and Bonpland.*

15. *H. serpylloides* (Cham. et Schlecht. Linnæa, 2. 574.).

Hab. Tropical Brasil, *Sello.*

These two species are described as suffrutescent, which I have not observed in any other one.

16. *H. cæspitosa* (Cham. Linnæa, 8. 32.).

Hab. Brasil, *Sello.*

17. H. *tomentosa* (Schiede et Depp. Linnæa, 5. 106.), "candidè lanata, caulibus repentibus ramosis flagelliformibus, foliis spathulato-ellipticis acutiusculis sessilibus, calycibus bibracteatis, bracteis calycisq. laciniis linearibus acuminatis aut acutis." *Ch. et Schl.*

Sect. 2. Caconapea. *Corollæ labium superius integrum vel breviter emarginatum, capsula oblonga, acuta, quadrivalvis, sepala post anthesin vix aucta externo lanceolato vel oblongo.*

18. *H. gratioloides*, glabra, erecta, foliis semiamplexicaulibus lineari-lanceolatis integerrimis, floribus axillaribus fasciculatis breviter pedicellatis bibracteatis, sepalo externo lanceolato.

Caconapea gratioloides. *Cham. Linnæa,* 8. 28.

Hab. Bahia. (*v. s.*)

19. *H. Ranaria.*

Ranaria monnierioides. *Cham. Linnæa,* 8. 31.

Hab. Brasil, *Sello.*

Sect. 3. Bramia. *Corollæ labium superius profunde emarginatum vel bifidum. Capsula subglobosa vel ovata, rarius oblonga, quadrivalvis. Sepala post anthesin aucta externo lato sæpe cordato.*

* *Folia omnia uninervia vel penninervia nec multinervia.*

20. *H. polyantha*, glabra, erecta, foliis petiolatis ovato-lanceolatis dentatis basi angustatis, pedunculis fasciculatis petiolo brevioribus versus apicem bibracteatis, sepalo externo lato cordato.

Hab. Brasil, Rio Janeiro, *Burchell;* St. Catherine's, *Tweedie.* (*v. s.*)

21. *H. calycina*, glabra, procumbens, foliis breviter petiolatis ovatis obtusis dentatis basi cuneatis, pedunculis brevissimis solitariis apice bibracteatis, sepalo externo lato cordato.

Hab. Senegambia, *Leprieur and Perrottet.* (*v. s.*)

22. *H. scabra*, subglabra, foliis ovatis oblongisve paucidentatis in petiolum brevem angustatis et sæpe amplexicauli-dilatatis penninerviis supra scabris, pedunculis in axilla quaque 1—2 calyce longioribus apice 1—2-bracteatis nudisve, sepalo externo lato subcordato.

23. *H. stellarioides* (Cham. Linneæ, 8. 32.), glabra, erecta, foliis lanceolato-linearibus subserratis amplexicaulibus uninerviis, pedicellis solitariis folio brevioribus sepalo externo ovato.

α. *Bahiensis*, pedicellis ebracteatis.

β. *Cayennensis*, pedicellis medio bracteatis, sepalo externo latiore.

Hab. α. Bahia, *Salzmann;* β. Cayenne, *Leprieur.* (*v. s.*)

24. *H. floribunda* (Br. Prod. 298), glabra, erecta, foliis lanceolato-linearibus integerrimis basi angustatis uninerviis, pedicellis in axilla quaque 1—3 versus apicem bibracteatis, sepalo externo lato demum subcordato.

H. lanceolata, *Wight—Benth. Scroph. Ind.* 30.

H. linearis, *Spreng. Syst.* 2. 802?

HAB. Senegambia, *Leprieur and Perrottet*; Madagascar, *Bojer*; East Indian Peninsula, *Wight, &c.*; North Coast of Australia, *R. Brown, A. Cunningham.* (*v. s.*)

25. *H. Hamiltoniana* (Benth. Scroph. Ind. 30), glabra, erecta, foliis lanceolatis integerrimis basi angustatis uninerviis, floribus subsessilibus solitariis bibracteatis, sepalo externo lato cordato.

HAB. Susanaghur in East India, *Hamilton.* (*v. s.*)

26. *H. Thonningii*, glabra, basi repens, foliis sessilibus lanceolatis serratis basi angustatis uninerviis, pedicellis brevibus solitariis sub flore bibracteatis, sepalo externo ovato.

Erinus africanus. *Schum. Beskr. Pl. Guin.* 278 *non Linn.*

HAB. Ningo in Guinea, *Thonning.*

I have not seen the plant, but the description from which the above character is taken leaves no doubt either as to the genus or to the specific character.

27. *H. sessiliflora*, glabra, erecta, foliis oblongo-linearibus lanceolatisve apice serratis basi angustatis uninerviis, floribus subsessilibus solitariis bibracteatis, sepalo externo ovato.

HAB. Cayenne, *Leprieur.* (*v. s.*)

28. *H. madagascariensis*, glabra, basi repens, foliis oblongis vel oblongo-ovatis integerrimis vel obscure dentis basi amplexicaulibus parum angustatis uninerviis vel obscure penninerviis, pedicellis folio dimidio brevioribus apice bibracteatis, sepalo externo lato ovato.

HAB. Madagascar, *Herb. Hooker.* (*v. s.*)

** *Folia basi plurinervia nervis simplicibus vel rariùs intermedio pinnato.*

29. *H. Monniera* (Humb. et Kunth. Nov. Gen. et Sp. amer. 2. 294.) repens, glabra, foliis obovato-cuneatis, integerrimis vel obscure paucicrenatis, enerviis vel obscure 1—3-nerviis, pedicellis solitariis apice bibracteatis, sepalo externo ovato.

Gratiola Monniera. *Linn. Amœn. Acad.* 4. 306.

Capraria Monniera. *Roxb. in herb. plur.*

Bramia indica. *Lam. Dict.* 1. 459.

Monniera cuneifolia. *Mich. Flor. Bor. Amer.* 2. 22.

Monniera africana. *Pers. Syn.* 2. 166?

Monniera pedunculosa. *Pers. Syn.* 2. 166?

Monniera Brownei. *Pers. Syn.* 2. 166.

Herpestis cuneifolia, *Pursh, Fl. Amer. Sept.* 2. 418.

Herpestis procumbens. *Spreng. Syst.* 2. 802.

Calytriplex obovata. *Ruiz et Pav. Prod. Fl. Per. et Chil.* ?

Gratiola portulacacea. *Weinm in Syll. Pl. Ratisb.* 1. 222.

HAB. Africa, Asia, and America, within and near the tropics. (*v. s.*)

30. *H. lanigera* (Cham. et Schlecht. Linnæa, 2. 573.) repens, caule villosissimo, foliis ovato-orbiculatis amplexicaulibus integerrimis penninerviis et basi submultinerviis glabris vel subtus villosis, pedunculis solitariis folium subæquantibus apice bibracteatis, sepalo externo lato cordato.

HAB. Tropical Brasil, *Sello*; Rio, *Burchell.* (*v. s.*)

31. *H. Salzmanni*, caule villosissimo, foliis ovato-orbiculatis amplexicaulibus integerrimis glabris obscure penninerviis multinerviisque, pedicellis solitariis folio longioribus ebracteatis, sepalo externo lato cordato.

HAB. Bahia, *Salzmann.* (*v. s.*)

32. *H. rotundifolia* (Pursh. Fl. Amer. Sept. 2. 418?) caule glabro vel villosulo, foliis obovato-orbiculatis integerrimis multinerviis glabris, pedicellis in axilla quaque 1—3 folio brevioribus ebracteatis, sepalo externo ovato.

Monniera rotundifolia. *Mich. Fl. Bor. Amer.* 222.

HAB. Western States of North America. (*v. s.*)

33. *H. micrantha* (Pursh. Fl. Amer. Sept. 2. 418?) glabra, foliis ovalibus integerrimis amplexicaulibus obscure multinerviis, pedicellis solitariis folia subæquantibus ebracteatis, sepalo externo cordato.

HAB. New Jersey. *Herb. Hooker*; Bahia, *Salzmann.* (*v. s.*)

34. *H. amplexicaulis* (Pursh, Fl. Amer. Sept. 2. 418), caule villoso, foliis amplexicaulibus ovatis obtusis integerrimis multinerviis glabris vel nervis subtus villosis, pedicellis solitariis calyce brevioribus subbibracteatis, sepalo externo cordato.

Monniera amplexicaulis. *Mich. Fl. Bor. Amer.* 2. 222.

HAB. Southern States of North America. (*v. s.*)

I omit the following species as being very doubtful, viz.

H. domingensis. *Spreng. Syst.* 2. 801.

H. erecta. *Spreng. Syst.* 2. 801.

H. montevidensis. *Spreng. Syst.* 2. 802.

H. rugosa. *Roth. Nov. Pl. Sp.* 289.

H. floribunda. *Roth. Nov. Pl. Sp.* 289, *non Br.*

IX. HYDROTRICHE. *Zuccarini.*

TRIBUS GRATIOLEARUM.

To Zuccarini's excellent description must be added: *Capsula bivalvis, valvulis integris medio septiferis,* which appears to be the only character in which the genus differs from *Dopatrium.* The calyx is long, and tubular, often not cleft below the middle. The peduncles are reflexed after the flowering is over.

X. GLOSSOSTIGMA. *Arn.*

TRIBUS GRATIOLEARUM? vel VERONICEARUM?

Calyx brevis, campanulatus, 3-dentatus. *Corolla* minima, tubo calycem æquante, limbo 5-fido laciniis omnibus planis subæqualibus. *Stamina* fertilia 2. *Filamenta* recta, integra. *Antheræ* approximatæ, biloculares, loculis parallelis. *Stigma* dilatatum. *Capsula* bivalvis valvulis integris medio septiferis.

1. *G. spathulata.* (Arn. MSS.)

Microcarpæa spathulata. *Hook. Bot. Misc.* 2. 101. *Suppl. t.* 4.—*Benth. Scroph. Ind.* 31.

Limosella diandra. *Linn. Mant.* 252?

HAB. Senegambia, *Leprieur and Perrottet;* East Indian plains and Peninsula, *Royle, Wight, &c.* (*v. s.*)

The genus Limosella, containing the *L. aquatica* and *L. capensis,* appears to belong to the *Veroniceæ* near *Sibthorpia.* Perhaps the *Glossostigma* would also be better placed there; for, as in *Sibthorpia* and some of the annual *Veronicæ,* the dissepiment of the capsule does not appear to reach the top, even in the ovary.

XI. NUXIA. *Vent.*

TRIBUS BUDDLEIARUM.

Calyx brevis, campanulatus, regularis, 4-dentatus vel 4-fidus. *Corolla* tubo brevi, limbo regulari 4-partito patente. *Stamina* 4, fauce inserta, æqualia, exserta. *Antheræ* distantes biloculares. *Stylus* simplex, stigmate integro incrassato. *Capsula* septicide bivalvis, valvulis bifidis subintegrisve marginibus inflexis.—*Frutices Austro-Africani sæpe tomentosi.* Folia *opposita vel subverticillata, integra, sæpius dentata.* Flores *sæpius sessiles glomerulati, glomerulis sessilibus pedicellatisve, in paniculas terminales sæpius dispositis.*

1. *N. verticillata* (................) arborea, glaberrima, foliis subverticillatis petiolatis oblongo-ellipticis integerrimis, paniculis amplis fastigiatis, calycibus campanulatis lævibus glabris, staminibus breviter exsertis recurvis.

HAB. Madagascar, *Bojer.* (*v. s.*)

2. *N. floribunda,* arborea, glaberrima, foliis subverticillatis petiolatis oblongo-ellipticis integerrimis, paniculis amplis fastigiatis, calycibus tubuloso-campanulatis lucidis brevissime dentatis, staminibus corollæ laciniis longioribus.

HAB. Uitenhage district on the Zwartsops river, *Ecklon:* it occurs also in other Cape collections. (*v. s.*)

Very near *N. verticillata,* but the calyx is much more slender, flowers smaller, with longer stamina. Both species are near *N. saligna* in habit, but with broader leaves, perfectly glabrous.

3. *N. saligna,* arborea, foliis petiolatis oblongo-lanceolatis integerrimis subtus ramis calycibusque tomentosis, paniculis amplis fastigiatis.

Buddleia saligna, *Willd. Enum. Hort. Berol.* 1. 159.

Buddleia salicifolia, *Jacq. Hort. Schœnbr.* 1. 12. *t.* 59. *non Vahl.*

Scoparia arborea, *Thunb. Prod. Fl. Cap.* 1. 28.

Callicarpa paniculata, *Lam. Dict.* 1. 563.

Chilianthus oleaceus, *Burch. fide Schult. Syst. Veg. Mant. vol.* 3. 66.[1]

Hab. Cape of Good Hope in various districts. (*v. s.*)

4. *N. corrugata,* foliis lanceolatis margine crenato-crispulis supra lucidis rugosissimis subtus ramis calycibusque tomentoso-lanatis, paniculis paucifloris.

Hab. On the Witbergen in Cafferland, *Drège.* (*v. s.*)

5. *N. dysophylla,* divaricato-ramosa, foliis petiolatis ovatis grosse dentatis planis subtus vel utrinque ramis calycibusque dense tomentoso-lanatis, fasciculis florum laxis cymosis.

Hab. Uitenhage and Albany districts, and Neutral Territory, *Ecklon.* (*v. s.*)

6. *N. lobulata,* divaricato-ramosa, foliis petiolatis ovatis sinuato-lobatis dentatis undulato-crispis, subtus vel utrinque ramis calycibusque tomentoso-lanatis, fasciculis florum densissimis globosis.

Hab. Nieuweweld'sbergen and Kliplaatsriver, *Drège.* (*v. s.*)

XII. Buddleia. *Linn.*

Calyx Nuxiæ. *Corolla* regularis tubulosa vel subcampanulata, limbo breviter quadrifido. *Stamina* 4, fauce inserta, antheris subsessilibus, bilocularibus. *Stylus* et *Capsula* Nuxiæ.

This genus may be divided into two sections according to whether the corolla be campanulate or tubular. To the former division should be referred the greater number of the American species and the B. *virgata* from the Cape. To the second division with tubular corollas would belong two or three of the South American species, all the Asiatic ones, with *B. salviæfolia,* and the following new species from the Cape:—

[1] Burchell describes his *Chilianthus* as having the cells of the capsule monospermous; I have found them polyspermous in all the species of *Nuxia,* which makes me doubt the correctness of this reference.

B. auriculata, ramis subteretibus junioribus vix canescentibus, petiolis basi auriculo rotundato amplexicaulibus, foliis lanceolato-oblongis vel ovato-lanceolatis apice serratis basi angustatis supra glabris subtus albo-tomentosis, racemis brevibus paniculatis, glomerulis densis breviter pedunculatis, corollis tenuibus tomentosis.

Hab. On the Winterberg in the Neutral Territory, and on the Chumisberg in Cafferland, *Ecklon.* (*v. s.*)

NOTICE CONCERNING THE LATE MR. DRUMMOND'S COLLECTIONS MADE CHIEFLY IN THE SOUTHERN AND WESTERN PARTS OF THE UNITED STATES.

(*Continued from p.* 177. *Vol. I. of this Journal.*)

PLANTAGINEÆ. *Juss.*

795. Plantago *cordata,* Lam.—Exactly agreeing with a specimen from Dr. Torrey.—Louisiana. (*Barabino.*)

796. P. *Kamtschatika.* Cham. et Schlecht. —*Hook. et Arn. in Bot. of Beech. Voy. v.* 1. *p.* 156.—N. Orl. 1833.—Seeds two to three in each cell of the oblong much exserted capsule, in which it differs essentially from P. *major,* as observed by Chamisso. Our plant is quite glabrous.

797. P. *Virginica.* L.—Pennsylvania. Dr. Torrey remarks on this, that the stamens are *included,* which is not the case in my specimens: they soon fall away, and then the narrow sharp segments of the corolla meet together, as well described by Michaux (corollis anguste et subrostratim conniventibus), so as to form a kind of beak or horn to the flower.

798. P. *purpurascens.* Nutt. *Fl. of Ark. p.* 177.—N. Orl. (*n.* 269.)—The specimens exactly agree with original ones from Mr. Nuttall in my Herbarium. That author says, it is nearly allied to *P. Virginica;* but with the stamens always exserted. I had at first confounded it with

799. *P. Virginica:* though the segments of the corolla are certainly broader and

blunter, and do not seem disposed to form a beak over the capsule in a more advanced state.

800. P. *pusilla.* Nutt.—N. Orl. (*n.* 270.) Pennsylvania.—This plant is extremely common in the United States, in every parallel of latitude; and is readily distinguished by its slender habit, filiform leaves, and remote flowers. Bracteas and calyx-leaves ovate, green, with a broad white margin, generally glabrous. I have never seen the stamens exserted in any of my specimens (probably they are very fugacious). Corolla but little longer than the calyx; segments very small, eventually closing, but not so connivent as to form a beak. Capsule ovate, pale, shining, two-celled, each cell bearing two black oval seeds.—From Dr. Short I have specimens with scapes a span high, gathered at Milledgeville, Georgia, by Dr. Boykin. From specimens sent by Mr. Greene, it is clear that this is the *P. hybrida* of Barton, as is suspected by Dr. Torrey, who further doubts if it be not the *P. interrupta* of Lamarck and Elliott? Elliott's plant it cannot well be, for he describes it as a perennial, and with leaves much like those of *P. lanceolata.* It is probable that Michaux's *P. sparsiflora* may be a broad-leaved state of this plant; and the *P. Caroliniana* of Pursh, whatever Walter's plant of that name may be, I should have little hesitation in referring to *pusilla:* but so imperfectly have the American species been characterized, that it is not safe to speak positively, and without access to authentic specimens. Indeed few genera need a careful revision more than *Plantago.*

NYCTAGINEÆ. *Juss.*

801. Boerhaavia *erecta,* L.—Covington.

AMARANTHACEÆ. *Juss.*

802. Amaranthus *viridis,* L.—N. Orl. (*n.* 271 and 611?)

803. A. *polygonoides,* L.—N. Orl. (*n.* 272.)

804. A. *spinosus,* L.—N. Orl. (*n.* 272, bis.)—St. Louis.

805. A. *Blitum,* L.—N. Orl. (*n.* 272.)

806. A. *chlorostachys,* Willd.—St. Louis. Covington.

807. A. *paniculatus,* L.—St. Louis.

808. Bucholzia *polygonoides,* Mart. (*Achyranthes,* Lam. *Gomphrena,* L.) —N. Orl. (*n.* 273.)

CHENOPODEÆ. *Vent.*

809. Acnida *cannabina,* L. var.—N. Orl.

810. Chenopodium *album,* L. (spicis superioribus aphyllis paniculatis.)—Covington.

811. C. *ambrosioides,* L.—St. Louis.

812. C. *anthelminticum,* Mich. — St. Louis. Jacksonville.

813. C. *hybridum,* L.—St. Louis.

814. C. *Botrys,* L.—St. Louis.—On fine specimens of this, which I have received from Dr. Short, he says,—"I am surprized that Nuttall should say the species is not strictly indigenous to the United States, since the accompanying specimens were found on the almost inaccessible cliffs of the Kentucky river."

PHYTOLACCEÆ. *Br.*

815. Phytolacca *decandra,* L.—St. Louis. N. Orl. (*n.* 275.) and 1833.

POLYGONEÆ. *Juss.*

816. Brunnichia *cirrhosa,* Gærtn. — N. Orl.

817. Polygonum *punctatum,* Ell.—N. Orl. St. Louis.—Scarcely any thing more than a var. of our *P. Hydropiper.*

818. P. *mite,* Pers.—N. Orl. (*n.* 278.)—St. Louis.

819. P. *Persicaria,* L.—St. Louis. N. Orl.

820. P. *Pennsylvanicum,* L.—St. Louis.

821. P. *coccineum,* Ph.—*P. amphibium,* and *terrestre,* Torrey.—St. Louis.

822. P. *Virginianum,* L.—St. Louis. Jacksonville.

823. P. *cilinode,* Mich.—Alleghanies.

824. P. *scandens,* L.—St. Louis.

825. P. *sagittatum,* L.—N. Orl. (*n.* 276.)

826. P. *multangulare,* Hook. et Arn. (*sect.* Tiniaria); foliis sessilibus v. brevissime petiolatis lineari-oblongis acuminatis inferioribus basi hastatis nervo subtus cauleque angulato sparsim retrorso-aculeatis, ochreis elongatis obtusis glabris, pedunculis dichotomis glandulosis, spicis subcapitatis laxis paucifloris, bracteis ciliatis glabris.—N. Orl. (*n.* 277.) This seems to represent at N. Orleans the *P. arifolium* of the more northern States; and from that it is quite distinct as a species. The leaves are five to six inches long, and only five lines wide, most of them quite sessile.

827. Rumex *verticillatus,* L.—N. Orl. (*n.* 280 and 282.)—Alleghanies. St. Louis.—Authors seem not to have distinguished well between this and *R. Britannicus.* What I take for *R. verticillatus* is a tall growing plant, with long paniculated racemes, and flowers in leafless numerous more or less crowded whorls. Pedicels patent, half an inch in length, incrassated and deeply furrowed upwards, at length three-quarters of an inch long, singularly reflexed, giving the fructified branches a very remarkable appearance. Valves of the fruit broadly cordate, attenuate, obtuse, reticulated, bearing each a very prominent, oblong grain, two of them very large, the third smaller. The leaves are long, lanceolate, acuminate at both extremities. The stipules appear to be sheathing, but soon breaking away. It cannot be uncommon in N. America; for besides the stations above given, Mr. Drummond sent it from Texas: yet I have never received it from any American Botanist.

828. R. *Britannicus?*—N. Orl. (*n.* 281.) —I am very doubtful about this species. The sheaths are cylindrical, but torn. The leaves oblong, lanceolate, much crisped at the margin, all of them, even the upper ones, obtuse. Racemes panicled, leafless, rather slender. Whorls somewhat distant. Flowers dense, drooping, especially in fruit. Pedicels short, thickened at the very apex, smooth. Valves of the fruit ovate, obtuse, reticulated, each bearing a narrow-oblong, not very conspicuous, grain, nearly equal in size. These valves are much smaller, far less reticulated, and less membranaceous than in *R. crispus.*

829. R. *pulcher,* L.—N. Orl. (*n.* 279.)

LAURINEÆ. *Juss.*

830. Laurus *Carolinensis,* Catesb. N. Orl. (n. 285, bis.) and 1833.
L. *Benzoin,* L.—Pennsylvania; (leaves membranous, nearly glabrous).—Covington; (leaves subcoriaceous, nearly glabrous). N. Orl. (*n.* 284); (leaves subcoriaceous and very downy beneath). —St. Louis; (leaves membranaceous and very downy beneath).—This seems a very variable species in the form and texture of its leaves and in the degrees of downiness, and I may have confounded with it, the *L. Diospyrus,* Mich.—(*L. melissæfolia,* Walt.) with which I am not well acquainted.

831. L. *geniculata,* Walt.—N. Orl. (*n.* 283.) and 1833, Jacksonville.

832. L. *Sassafras,* L.—Pennsylvania. St. Louis.

SANTALACEÆ. *Br.*

833. Pyrularia *pubera,* Mx.—*Hamiltonia oleifera.* Willd. N. Orl. (*n.* 286.)

834. Nyssa *sylvatica.* Mx.—*N. villosa,* Willd.—Alleghanies.

835. N. *capitata,* Mx.—*N. candicans,* Willd.—N. Orl. (*n.* 287).

836. N. *grandidentata,* Mx.—*N. tomentosa,* Willd.—N. Orl. (*n.* 288.)

THYMELEÆ. *Juss.*

837. Dirca *palustris,* L.—N. Orl. 1833.

ARISTOLOCHIEÆ. *Juss.*

838. Aristolochia *Serpentaria.* L.—N. Orl. 1833.

839. A. *hastata.* Nutt.—N. Orl. 1833.—Smaller than A. *serpentaria,* with leaves much narrower, often linear-lanceolate, sometimes almost acute at the base: still I fear it is only a var. of A. *serpentaria.*

840. Asarum *arifolium*, Mx.—N. Orl. (*n.* 289.)
841. A. *Canadense*, L.—Alleghanies.

EUPHORBIACEÆ. *Juss.*

842. Phyllanthus *Carolinensis*, Walt.—*P. obovatus.* L.—*Maschalanthus obovatus*, *Nutt.*—Jacksonville.
843. Croton *glandulosus*, L.—Covington, N. Orl. 1833.—A hispid plant, well distinguished by the little Peziza-like glands at the base of the leaf. In *C. hirtus* of the West Indies, which is nearly allied to this, the glands are upon a long stalk.
844. C. *capitatus*. Mx.—St. Louis.
845. C. *ellipticus*. Nutt.—St. Louis.—A very distinct species from the preceding; though I believe often taken for it. I possess specimens from Mr. Griswold, Dr. Short, and Mr. Peter, gathered in Kentucky and elsewhere.—Crotonopsis *linearis*, Mx.—Jacksonville.
846. Jatropha *stimulosa*, Mx.—J. *urens.* Walt.—N. Orl. (*n.* 296.) Covington.
847. Acalypha *Virginica*, L.—*A. Caroliniana.* Fl. Cestr.—N. Orl.—St. Louis. Covington, Jacksonville.—Very variable in regard to pubescence, the length of the petioles and the breadth of the foliage. The Covington specimens have the leaves very narrow.
848. A. *Caroliniana*, Walt.—N. Orl. (*n.* 294). St. Louis.—Perfectly distinct from the former, in the long spikes of fructification and in the close serratures of the leaves which extend round the whole margin.
849. Styllingia *ligustrina*, Mx.—N. Orl. (*n.* 295). Covington.
850. Tragia *urens*, L.—N. Orl. (*n.* 293).
851. Euphorbia *corollata*, L.—N. Orl. (*n.* 292).—Covington. St. Louis.—Leaves sometimes quite linear.
852. E. *obtusata*, Ph.—N. Orl. 1833.—These specimens are very small and the leaves are petioled, truly cuneate, and even retuse at the apex.
853. E. *cyathophora*, Jacq.—St. Louis.
854. E. *dentata*, Mx.—St. Louis.
855. E. *Peplus*, L.—Alleghanies.
856. E. *Ipecacuanha*, L.—Pennsylv.
857. E. *hypericifolia*, L.—St. Louis.
858. E. *maculata*, L.— N. Orl. (*n.* 290). —var. N. Orl. (*n.* 291).
859. E. *cordifolia*, Ell.—St. Louis.

URTICEÆ. *Juss.*

860. Urtica *pumila*, L.—N. Orl. 1833. St. Louis.
861. U. *urens*, L.—N. Orl. abundant.
862. U. *Canadensis*, L.—St. Louis.—If *U. divaricata*, Ph. (who quotes Willdenow with a doubt) be a distinct species from the present, I have never seen it. Our plant varies in the more or less ovate or cordate form of the leaf, and in the greater or less degree of hispidity.
863. Bœhmeria *cylindrica*, Willd.—Urtica *cylindrica*, L.—St. Louis.—N. Orl.—A very variable plant. Sometimes the spikes of glomeruli are short and the flowers dense, when it becomes, as it appears to me, the *Urtica capitata* of authors: at other times the glomeruli on the spikes are distant and the spike itself bears leaves at the extremity, thus constituting a branch with lateral glomeruli, when the plant becomes *B. lateriflora.*
864. Parietaria *Floridana*, Nutt.—N. Orl. (*n.* 297).
865. Humulus *Lupulus*, L.—St. Louis.

ULMACEÆ.

866. Ulmus *Americana*, L.—Missouri;—no fructification.
867. U. *nemoralis*, Ait.—N. Orl. (*n.* 301.)
868. U. *fulva*, Mx.—St. Louis.
869. U. *alata*, Mx.—N. Orl. (*n.* 300.)
870. Celtis *occidentalis*, L.—N. Orl. (*n.* 320.)

SAURURIEÆ. *Rich.*

871. Saururus *cernuus*, L.—N. Orl. (*n.* 299.)

ARTOCARPEÆ.

872. Morus *rubra*, L.—Alleghanies. N. Orl. (*n.* 298.)

JUGLANDINEÆ. *D C.*

873. Juglans *nigra,* L.—St. Louis. (Leaves only.)
874. Carya *olivæformis,* Nutt.—N. Orl. (*n.* 308.) St. Louis.
875. C. *sulcata,* Nutt.—Alleghanies.
876. C. *amara,* Nutt.—N. Orl. (*n.* 309.)
877. C. *aquatica,* Nutt.—N. Orl. 1833.

AMENTACEÆ. *Juss.*

I. SALICINÆ. *Rich.*

878. Salix *tristis,* Ait.—Covington.
879. S. *falcata,* Ph.—St. Louis. Alleghanies.
880. S. *Babylonica,* L.—N. Orl. (*n.* 302.)
881. S. *nigra,* L.—N. Orl. (*n.* 303.)
882. Populus *heterophylla,* L.—*P. argentea,* Mx.—Louisville, N. Orl. (1833.)
883. P. *angulata,* L.—St. Louis. N. Orl. (1833.)

II. BETULINÆ. *Rich.*

884. Alnus *serrulata,* Willd.—N. Orl. (1833.)
885. Betula *lenta,* L.—Alleghanies.
886. B. *nigra,* Willd.—N. Orl. (*n.* 304.)

III. CUPULIFERÆ. *Rich.*

887. Fagus *ferruginea,* Ait.—Alleghanies, N. Orl. (*n.* 318.)
888. F. *sylvatica,* L.—Alleghanies.
889. Ostrya *Virginica,* Willd.—Alleghanies, N. Orl. (*n.* 320.)
890. Carpinus *Americana,* Mx.—Alleghanies, N. Orl. (*n.* 319.)
891. Corylus *Americana,* Mx.—Missouri.
892. Castanea *Vesca,* Gærtn.—N. Orl. (Leaves only.)
893. C. *pumila,* Mx.—N. Orl. (*n.* 310.) Alleghanies.
894. Quercus *Phellos,* L.—N. Orl. (*n.* 311.)
895. Q. *virens,* Ait.—N. Orl. (*n.* 312.)
896. Q. *imbricaria,* Mx.—St. Louis.
897. Q. *aquatica,* Walt.—N. Orl. (*n.* 313.) Jacksonville.
898. Q. *nigra,* L.—St. Louis, N. Orl. (*n.* 316 *bis.*)—Leaves more deeply divided than is usual in this species.
899. Q. *discolor,* Ait.—N. Orl. (*n.* 314.) —Perhaps, as Michaux suggests, a var. of Q. *tinctoria.*
900. Q. *coccinea,* Wang.—St. Louis.
901. Q. *Catesbæi,* Mx.—Jacksonville.—In my specimens the glands are singularly depressed, and more than three-fourths buried in the capsula.
902. Q. *Banisteri,* Mx.—Alleghanies.
903. Q. *alba,* L.—N. Orl. (*n.* 315.)—St. Louis, Jacksonville.
904. Q. *obtusiloba,* Mx.—St. Louis, N. Orl. (*n.* 317.)
905. Q. *Prinos,* L.—*Q. Prinos, palustris,* Mx.—N. Orl. (*n.* 316.) St. Louis.

MYRICEÆ. *Rich.*

906. Myrica *cerifera,* L.—N. Orl. (*n.* 305.) Jacksonville.
907. M. *Carolinensis,* L.—N. Orl. (*n.* 306.) Jacksonville.
908. M. *Pennsylvanica,* L.—N. Orl. (*n.* 307.)—Apparently not distinct from M. *Carolinensis;* and even this latter Dr. Torrey is disposed to consider a luxuriant state of *M. cerifera.*
909. Liquidambar *styraciflua,* L.—N. Orl. (*n.* 321.)

CONIFERÆ. *Juss.*

910. Juniperus *Virginiana,* L.—N. Orl. (*n.* 323.)
911. J. *communis,* L.—Pennsylvania.
912. Taxodium *distichum,* Rich.—N. Orl. (*n.* 322.)
913. Pinus *variabilis,* Ph.—N. Orl. (*n.* 324.)
914. P. *australis,* Mx.—N. Orl. (*n.* 325.)
915. P. *pungens?* Mx.—Alleghanies.—The foliage quite accords with the figure of Michaux, but the specimens are destitute of fruit.
916. P. *rigida,* Muhl.—Alleghanies.
917. P. *Tæda,* L.—N. Orl. (*n.* 326.)

(To be continued.)

ON THE ESCULENT PLANTS OF VAN DIEMEN'S LAND.

(Continued from page 41.)

In regard to the *Account of the most Common and Remarkable Indigenous* plants of Van Diemen's Land, we shall confine ourselves to a few extracts respecting the more interesting kinds.

Acacia decurrens, Black Wattle. This beautiful tree grows in almost all parts of the island, unfolding its whitish blossoms about midsummer: its bark is the best for tanning. The generic name of *Acacia* was given to a large division of the genus *Mimosa* by Willdenow; no species of *Mimosa* (derived from the Greek *mimos*, a *mimic*, because it mimics animal sensibility, the leaves collapsing at a touch) properly so called, has yet been found in Van Diemen's Land. Many of the species produce gum abundantly, which is useful in the shops; the *Gum Arabic* exudes from *A. vera*, a stunted tree, growing in most parts of Africa, but the gum exported to England is chiefly collected in Barbary.

Acacia affinis, Silver Wattle. A much hardier tree than the foregoing, often attaining a large size in elevated situations. On the borders of the Hobart-Town Rivulet there are some stupendous individuals of this species, rivalling in height, but far excelling in beauty, the large Gum-Trees (*Eucalyptus*) among which they grow. It endures the winters of England, where its elegant foliage and bright yellow globe-headed and fragrant flowers are much admired. In a garden at Exeter and another at Norwich, there are trees of it raised from seed sent from Hobart Town, from three to four yards high. The seeds were transmitted to England under the erroneous name of *Black Wattle Mimosa.*

Acacia Melanoxylon, Lightwood, or *Blackwood.* This tree obtains its first name from the gravity, and its second from the colour of its wood. It is much used for furniture, the butts of the trees being cut into beautiful veneers, or turned into finely-streaked snuff and other boxes. It is peculiar to Van Diemen's Land, and grows to the largest size in the most mountainous and coldest situations.

Acacia saligna? Willow-leaved Acacia. A fragrant flowering species, forming a large shrub, and plentiful on the sides of rivulets. This, the *A. Melanoxylon*, and all the entire-leaved and prickly species are remarkable for bearing the pinnated leaves on the young seedling plants, in connexion with the others, which, in a warm sunny day, when the tender pores are open, will often collapse at a touch, like the *Mimosa* of the tropics.

Acæna Sanguisorba, Native Burnet, and *A. ovina, Round-headed Burnet.* The former species grows also in New Zealand, and the latter is common in New South Wales. It is the plant which, when the seeds are ripe, in December and January, hooks the prickly thorns with which these are furnished, into the clothes and limbs of the traveller, and also to the fleeces of the sheep grazing through the bush; it is these thorns and the awny seed of the *Kangaroo Grass* intermixed with the wool, and which no washing will remove, that depreciate the value of much that is sent to Europe, as well from Van Diemen's Land as New South Wales. Hence the advantage of shearing the sheep as early in the season as possible, on the first approach of warm weather, rather than leave the operation to a later period, when these injurious seeds shall have come to maturity. The wool will then be comparatively clean, and the sheep being so recently clipped, the seeds, when ripe, will not be so ready to adhere and spoil the fleece of next year. Attention to this little circumstance would add at least 25 per cent. value to the wool sent from many parts of this island in the London market. It is to be observed, however, that the close grazing which has prevailed in the sheep districts of Van Diemen's Land, for some years past, is not only gradually improving the pastures in fertility, but by preventing the grasses, &c. from seeding, and obliging them to propagate only by roots, leaves the surface free from those noxious particles that deteriorate the wool. Until, however, a well-devised

fencing-act has passed the legislature, and settlers are enabled to divide their farms into moderately-sized enclosures, so as to leave the shepherd, instead of constantly following his sheep and watching that they neither stray nor are stolen, more at liberty to devote his attention to the personal comfort of his charge, and to cut and clear incumbrances away and eradicate noxious weeds, the art of sheep-grazing and wool-growing in Van Diemen's Land will not be brought to perfection. The name of this plant is derived from *akina, a thorn,* in allusion to the seeds only.

Altingia Cunninghami? Cunningham's Pine. The beautiful trees of the Pine tribe, lately discovered by Mr. Ronald Gunn, at the Falls of the River Meander, and also by Mr. J. W. Scott, the collector, on the banks of the Hucon, probably belong to this species. It grows about thirty feet high, and is named after Mr. Cunningham, late the King's Colonial Botanist, at Sydney. The Norfolk-Island species (*Altingia excelsa*) attains, in its native soil, a height of one hundred feet, and thrives well when introduced to Van Diemen's Land. A fine one, planted about ten years ago, in the government gardens, promises to bear cones this season.

Arundo Phragmites, Common Reed. Apparently the same as the European species. It grows in the lagoons and marshy places plentifully, and is very useful for thatching; also, when tied together in mats, for screens or covers in kitchen gardens. The panicles will dye wool green, and the root is said to be useful in liver complaints.

Aster argophyllus,[1] *Musk-Tree.* This beautiful shrub, peculiar to Van Diemen's Land, is already common in the gardens and shrubberies about Hobart-Town, to which it is a great ornament. The light-green oval leaves are highly odoriferous on a warm day: they are slightly toothed at the edge, silky beneath, and when young, covered thickly on the surface with a fine powder, which may be rubbed off with the finger. Its blossoms are white, and the shrub grows generally to ten or fifteen feet, in moist forests even attaining fifty feet.

Atriplex Halimus. Barilla, or *Botany Bay Greens.* This is the plant so common on the shores of Cape Barren and other islands of the Straits, from which the alkaline salt is obtained and brought in boats to the soap manufactory at Hobart-Town. It has been considered identical with the species that grows on the coast of Spain and other parts of Europe. It rises to the height of several feet, and its light-coloured silvery foliage forms an agreeable object in shrubberies, when mingled and contrasted with the darker hues of the Stringy Bark and other native plants.

Banksia australis.[1] The common *Honeysuckle-Tree* of Van Diemen's Land. The genus *Banksia,* of which there are thirty-five species already known, was named by the younger Linnæus after the late Sir Joseph Banks, President of the Royal Society, and the species are all appropriately named by Mr. Brown.[2] The present one is a great ornament to the hills of this island, and its wood is useful for many purposes. When planted in rows and well clipped, it forms a stout and impervious hedge, not surpassed by the hawthorn or the holly. Its name of Honeysuckle is derived from the large quantity of sweet juice or syrup in the cells of the ovary. It is often used as a break or a drag by the settlers for harrowing in grass or small seeds, and by the bakers for heating their ovens. The young shoots of the branches have a singular appearance, from their brown colour, and downy, or, botanically speaking, tomentose nature, kindly designed by Providence, like the soft hair on newly-fledged birds, to protect the yet unformed and tender parts from the cold.

Betula antarctica, Australian Myrtle. A beautiful dark green-leaved tree, growing in many parts of the island, and forming the great Myrtle-Forest, twenty miles long, in Emu Bay. It is found on

[1] Botanical Magazine, tab. 1563. Long cultivated in the green-houses of this country.

[1] Botanical Register, 787.

[2] Dr. Brown alone has described forty-two species in the *Prodromus Floræ Novæ Hollandiæ,* and the *Supplement* to that work.—Ed.

the side of Mount Wellington, but has not yet been successfully introduced into gardens. This tree, however, is not a species of *Betula*, the young shoots, in their earlier stages, appearing to have been mistaken for the male blossoms by the English Botanists.

Billardiera fusiformis (*Sollya heterophyllæ*, Lindl.—Bot. Mag. t. 2523.), *Spindle-fruited Appleberry*,—and *B. scandens*,[1] *Climbing Appleberry*, are found on the northern side of the island, and bear a green eatable fruit.

Cassytha pubescens, Downy Cassytha:—*C. melantha, Black-budded ditto*:—and *C. glabella, Smooth-budded ditto*. These three curious plants are generally known in the colony by the name of *Wire-Grass*, and present a great obstruction in passing through the bush in various parts of the country, especially in the dense scrub which extends for many miles on this side of Macquarrie Harbour, growing so thick in some places as to bear the weight of a man walking upon them. They are all parasites, depending on other plants for support instead of taking root in the ground. About Hobart-Town the first species is common, forming often near the ravines pleasing shady natural arbours, its long wiry stems hanging in mats from the other trees, which it weighs down and covers. All are destitute of thorns, and produce greenish slimy berries. *C. melantha*, which is of a darker green, and far more beautiful than the others, is frequent in the northern part of the island; while *C. glabella*, a very slender species, grows about George-Town. They are easily propagated by slitting the bark of a smooth tree, as any of the *Acacias*, and inserting the seed; while rough-barked plants, as the *Geranium*, are uncongenial to the young slender shoots.

Casuarina torulosa? She-Oak:—*C. stricta? He-Oak*:—*C. tenuissima? Marsh-Oak*. The name of the first of these is said to be a corruption of *Sheac*, the name of an American tree, producing the Beefwood, like our *She-Oak*. The second species has been called *He-Oak*, in contradistinction of *She-Oak*, as if they constituted one diæcious plant, the one male and the other female; whereas they are perfectly distinct species. *C. torulosa*, or the *Cork-barked* species, closely resembles *C. equisetifolia*, or the *Horse-Tail* of the South Sea Islands, its leaves or branches hanging down in bunches from twelve to eighteen inches in length, like a horse's tail, and all jointed from top to bottom. The tree has a brownish colour, but is of a very elegant appearance; some beautiful specimens growing in the Rev. Mr. Conolly's allotment, beside the Roman Catholic Chapel. *C. stricta* is of a darker green, with short upright leaves, and grows abundantly in the ravines about Hobart-Town. The South Sea Islanders call it "Clubwood," from the use they make of it in warlike weapons.

Chorizandra sphærocephala, Globe-headed Chorizandra. A plant, common in moist places, resembling the *Juncus conglomeratus*, or *Common Rush* of England, and like it, useful for making bands, or light baskets: hence its name from *jungo, to join*, because the first ropes or binders were made of rushes. The pith is often used in the stock-huts, dipped in fat, to burn as watch-lights.

Cibotium Billardieri, Common Tree-fern (*Dicksonia antarctica* of La Billardière). This noble tree was introduced last summer into the gardens of Hobart-Town, and seems to thrive best, where it enjoys shelter, and is not much exposed to the high winds, which break its beautiful and far-extended leaves. It is said to grow well in England, being much better suited to that climate than the *Tree-Fern* (*Dicksonia arborescens*) of St. Helena. It will bear removing to Europe, if laid on the deck or other airy situation during the voyage. It grows in the ravines and shady places round Hobart-Town, a particularly fine grove being seen on the northern branch of the town rivulet, about a mile from the Cascade. But the place where it can be surveyed to most advantage, and which is of easiest access in this vicinity, is

[1] Bot. Mag. tab. 801.

at Sassafras Valley, where it fills a ravine, its upright shafts springing to a height of forty or fifty feet, and giving the groupes the appearance of a verdant columnar temple. This spot is accessible on horse-back, as it is only necessary to dismount and walk a few yards, and the grove itself, with the ride of about four miles from town, up the valley, will well repay the labour of a visit. The palmy, tropical appearance of this *Fern,* and the elegant green spires of the *Sassafras,* form a striking and picturesque contrast. The *Alsophila,* or *Tree-Fern* of the western side of this island, grows to a still greater size, and the trunks of both contain edible pith, or Bread-fruit of the natives.

Clematis blanda,[1] *White Virgin's Bower.* Throughout the spring this beautiful white-flowered climber adorns the bush in every direction, varying much in size, from the thickness of a quill to that of a man's arm, and in the latter case, suspending its fine white spreading blossoms like a white cloth over the summits of the highest Gum-Trees, with the rope or cable-like jointed stem, hanging down to, or rather growing out of the ground. In these situations, as it does not embrace the tree, it would seem to have risen and grown along with it. The present, however, may be a variety, or perhaps a different species, from that found climbing on the lower shrubs. It is singular that so remarkable and lovely a plant should have remained unnoticed by Botanists until Sir W. J. Hooker determined it, from specimens sent home by Mr. W. J. Scott, the late Mr. Lawrance, and Mr. Gunn, to be a new species, distinct from *C. aristata.*

Comesperma volubilis, Twining Comesperma. It is impossible to conceive any plant that would prove more ornamental in a garden, than this beautiful little climber, the blossoms of which hang in blue festoons among the bushes in all parts of Van Diemen's Land during the spring. It is easily raised from seeds, cuttings, or roots.

Convolvulus erubescens, Maiden-Blush Bindweed. — The pretty pink-coloured dwarf *Convolvulus,* common by the road-sides, in sunny places. Few genera are more numerous in species than *Convolvulus* (Sprengel enumerates three hundred and thirty-five, and some others have since been discovered), but the present and *C. angustissimus,* the *Narrowest-leaved Bindweed,* are the only ones yet found indigenous in Van Diemen's Land.

Cryptocarya glaucescens? Australian Sassafras. This beautiful pyramidal tree is common in warm sheltered, moist situations in various parts of the colony. Its bark and foliage are highly odoriferous, and when seen growing among the dusky *Gum-Trees,* the glaucous colour of the leaves gives it a striking appearance.

Dacrydium cupressinum? Huon Pine. A height of one hundred feet, and a circumference of thirty, are generally attained by this splendid pyramidal tree, which also stands almost unrivalled for richness of aspect, from the great extent to which it spreads its limbs, whence depend numerous slender branchlets of the liveliest green. It grows in spongy soils, where the climate is mild. Some uncertainty exists as to whether this species be correctly named, or even if it belong to the genus *Dacrydium* at all, the origin of which word is from *Dakru,* a tear, in allusion to the gummy exudation that drops, like tears, from the tips of the little boughs. It grows in Macquarrie Harbour, and on the banks of the Huon River, so called after Captain Huon Kermandeé, who commanded the ship Espérance, which in the year 1791—4 visited these shores, in quest of the celebrated and unfortunate La Peyrouse.

Decaspora disticha, Two-leaved Decaspora,—and *D. thymifolia, the Thyme-leaved ditto.* These are small-leaved, low-spreading, mountain shrubs, bearing flattened purple-red berries, and grow plentifully on Mount Wellington. For an edging to flower borders, or to lay a small garden-walk, as a substitute for grass, nothing can be more eligible than the latter species (the *Thyme-leaved Decaspora*), the fragrance of its leaves perfuming the air as you walk upon them.

[1] Botanical Journal, p. 241, and p. 273 of the first volume of the present work.

Dianella cærulea,[1] *Blue Dianella*,—and *D. revoluta*, *Narrow-leaved ditto*. Besides the recommendation of their blue flowers and berries, the flag-like foliage of these and another plant found on the sea-coast (probably a species of *Anarthria*), are used for making baskets by the Aborigines, who prepare the leaves by drawing them over a fire, by which they are softened and rendered more flexible: those of the *Anarthria* require also to be previously split.

Eucalyptus globulus, *Blue Gum-Tree of Hobart-Town*:—*E. robusta*,[2] the *Stringy Bark*:—*E. resinifera*, *White Gum*, or *Kino Gum-Tree*:—*E. Piperita*, *Peppermint-Tree*:—and *E. myrtifolia*, *Myrtle-leaved Gum-Tree* (from Port Davy). Besides these, there are the *Mountain Blue Gum*, the *Weeping* or *Blue Gum of Norfolk Plains*, the *Black-budded or Common Gum*, and the *Black Gum-Trees*:—of the latter the bark and spreading branches, with their umbrageous foliage, bear much resemblance to the English Elm; the *Iron Bark*, growing mostly on the northern coast, and the *Cider-Tree*, from which a saccharine gum exudes, and which, with the *Myrtle-leaved Gum-Tree*, grows in the higher parts of the island, and on the tops of the mountains,—all of these belonging to the genus *Eucalyptus*. In the upper part of Mount Wellington there are three other kinds; while *E. globulus* is confined to the Southern and Eastern portions of the island. The wood of all the species is highly useful for domestic and other purposes; being so soft at first as to render the felling, splitting, and sawing up of the tree, when green, a very easy process, and when thoroughly dry, becoming as hard as Oak. They are all of remarkably quick growth, and many attain an enormous size. *E. globulus* and some of the other species have the singular property of casting off their grey or whitish bark in longitudinal strips or ribbands, which, hanging down from the branches when shaken about by the breeze, have a remarkable appearance in the woods, until quite peeled off by the force of the winds. The leaves are alike on both sides, and present their edge to the body of the trunk or branch to which they belong: they also have the peculiarity of growing with the wood, being at first small and scarcely formed, with a reddish yellow tinge, giving to the groves of young trees, even in spring, the landscape tints of an English autumn.

The genus is named from *eu* (*well*), and *kalupto* (*to cover*), from the circumstance of the blossom being covered with a lid, which, when the flower expands, falls off and discloses a four-celled capsule or seed-vessel, each filled with numerous small seeds. The common name of *Gum-Tree* was given to the genus, from the large quantities of strong astringent juice which the trees contained. In cutting down a Stringy-Bark Tree, for instance, (*E. robusta*,) we often find large cavities, between the annual concentric circles of the trunk, filled with a most beautiful red or rich vermilion-coloured liquid gum, which flows out as soon as the saw has afforded it an opening. The gum yielded by *E. resinifera* is considered by druggists as not in the least inferior to the *Kino* which the *Pterocarpus, or Red Saunders-Wood* of India produces.

Several of the species yield an exudation that may be called a sort of *manna*, in the spring and summer months, which coagulates and drops from the leaves to the ground, in small, irregularly-shaped, snow-white particles, often as large as an almond. These are very sweet and pleasant to the taste, and are greedily devoured by the birds, ants, and other animals, and used to be carefully picked up and eaten by the Aborigines.

On the whole, this noble genus may be said to have taken undisturbed possession of these Australian regions, clothing, as it does, with a stupendous mantle, the surface of both Van Diemen's Land and New Holland, while the intermixture of other plants, which this lordly tribe occasionally permits, is, compared with its own great extent, but small and partial! Wherever

[1] *Botanical Magazine*, tab. 505.
[2] Smith's *New Holland Plants*, tab. 13.

you go, the *Gum-Tree,* of one species or other, constantly presents itself before you.

Exocarpus cupressiformis, Native Cherry, or *Cypress Cherry :—E. strictus, White Cherry :—E. humifusus, Trailing Cherry.*—The first of these is common all over the island, its beautiful Cypress-like, conical form, as contrasted with the *Banksias* and *Gum-Trees,* very much enlivening the landscape. It is destitute of leaves, but the elongation of the branches gives it the verdant appearance: it thrives best in clusters, and under the shelter of other trees. The last species is common on the top of Mount Wellington. The generic name is derived from *Karpos,* the fruit, the nut being outside the pericarp.

Gaultheria hispida, Wax Cluster.[1]—A straggling, but highly ornamental plant, its snow-white berries hanging together like wax. In the middle region of Mount Wellington and other high places, it is plentiful.

Gastrodia sesamoides, Native Potato.—This curious plant, belonging to the Orchis tribe, is described in the foregoing list of the eatable plants and roots of this country. I have frequently tried to propagate it from the root, in the hope of improving its quality by cultivation, but the parasitical nature of the plant has caused all my endeavours to fail.

*Leptospermum lanigerum, Hoary Tea-Tree :—L. baccatum, Smooth or berry-bearing Tea-Tree :—L. flexuosum, Forest ditto :—*and *L. glandiflorum, Large-flowered ditto.*—Beautiful myrtle-like plants, which, with several other species of the same genus, clothe the sides of all our rivers and streams, and other parts of the bush. The first was used as a substitute for Tea by the early Colonists, and its long straight stems furnish the spears of the Aborigines, who harden the points by fire, and sharpen them with a flint or shell. *L. scoparium,* a broom-leaved species, common in dry places near the coast of New Zealand, was also employed as Tea by Captain Cook's ship-crews, who found the underwood about Adventure Bay to consist of the same plant. All the species, of which there are thirty, are white-flowered, with the exception of *L. stellatum,* which bears yellow blossoms. They are easily raised from seed, and cuttings of them also strike readily in a shady light soil; and they are very eligible shrubs for hedges, being remarkably pretty and evergreen, with fine flowers.

Mesembryanthemum æquilaterale, Pig-Faces :—Canagong, or *Fig-Marigold.*—A singular, three-sided, light green, and fleshy-leaved species (mentioned in the list of eatable plants), with starry pink or purple blossoms, and found so abundantly in rocky places and dry sandy soil, that it is said to be the most generally diffused plant over the whole of Australia.

*Ozothamnus cinereus, Grey Ozothamnus :—O. rosmarinifolius, Rosemary-leaved ditto :—*and *O. ferrugineus, Rusty ditto.*—A genus of beautiful plants, peculiar to Van Diemen's Land, of easy cultivation and rapid growth. The young expanding heads of white flowers show themselves first in October, in pretty yellow or light purple knobs at the tips of the branches. All these species have narrow leaves, and have long been common in front of the houses and gardens about Hobart-Town, as they can be cut into any shape, and make neat sheltering screens and hedges. Several other kinds grow in the colony, the most remarkable of which is an elegant plant, with thick fleshy foliage, downy underneath, and placed in a regularly opposite order all along the branches.

Polygonum prostratum, Trailing Persicaria :—P. strigosum, Straw-like ditto :—P. adpressum,[1] *Macquarrie Harbour Vine :—*and *P. aviculare, Hog-weed.*—The last of

[1] Another, and equally ornamental species, the now well-known *Shallon* of our gardens, belongs to this genus: it is the *Gualtheria Shallon,* see Bot. Mag. t. 2843. In North-West America, whence this plant was introduced a few years ago to our gardens, by the late Mr. D. Douglas and Dr. Scouler, the natives make a cake of the berries, which will keep for many years, and the Colonists eat them in tarts. It bears fruit abundantly in this country, which we should doubtless prize, did not our more highly favoured climate, and the skill of the Horticulturist, furnish us with better kinds of fruit.—ED.

[1] Bot. Mag. t. 3145.

these, having been unfortunately introduced among seed-wheat from England, has now naturalized itself in this country, proving one of the most obstinate weeds the farmer or gardener has to contend with; for though it be only of annual duration, it ripens its seeds so plentifully and so quickly, that wherever it has gained a footing it fixes itself for ever. *P. adpressum*, the *Macquarrie Harbour Vine*, has become very common as a climber about Hobart-Town, and is also not unfrequent in other parts of the island, thriving best in rich moist soil, and growing readily from cuttings. Mr. Lempriere first brought it into notice a few years ago, its berries furnishing an agreeable acid.

Richea dracophylla,[1] *Broad-leaved Grass-Tree.*—A beautiful shrub, abundant on the upper part of Mount Wellington. Some specimens of it, or another species of the same genus, were some time ago brought to Van Diemen's Land from the Peak of Tenériffe, under the name of *Cabbage-Tree*, and described as producing single heads, like an American Aloe, on a tall stem; a mode of growth which it assumes at Port Davy. On Mount Wellington it is much branched, and bears smaller heads at the termination of each shoot; from the centre of these spring its beautiful spikes of white flowers, with shades of white, pink, and green upon the larger bracteas that, in their early stage, are interspersed among them. It is decidedly the most strikingly beautiful of all the Van Diemen's Land plants.

Sida pulchella, Currijong, or *Cordage Tree of Hobart-Town*:—*Sida discolor, Two-coloured Sida.*—The former is a beautiful plant, with light green unequally-sized leaves and jagged edges, bearing white and pink flowers, and growing on the borders of most of the streams. Its bark used to be employed for tying together posts and rail-fences, and the rafters of huts, during the earlier periods of the colony, before nails could be easily procured.

[1] For a very interesting account of the Botanist, after whom this genus is named, see the Botanical Magazine, tab. 3251.

Xanthorrhea australis, Southern Grass-Tree:—*X. humilis? Dwarf ditto*:—and *X. arborea, Large ditto.*—The large species is a most remarkable, strong, grassy, or bent-leaved plant, flowering early in spring, and sending up a very long scape, or club-like head (often from two to four or five feet high), and exuding a resinous gum, said to possess, in a great degree, the virtue of the *Dragon's Blood* of the *Pterocarpus*, and *Calamus*. As it grows from year to year, this gum continues to exude, so as to be easily collected in large quantities in the sandy places where the plant is found; as at Grass-Tree Hill and on Bruné and Flinders' Islands. When Captain Smith, of the Caledonia, was at Western Port, in 1825, he discovered it in profusion, and by boiling the gum with oil, made a very good and cheap composition for covering the bottom of his vessel, instead of pitch. The heart or pith of this tree is sometimes cut out and eaten by the Aborigines. *X. australis* is probably the *Grass-Tree* of Prosser's River and Rocky Cape; *X. humilis* grows at York Town. The species common on the East coast, between Swan Port and St. Patrick's Head, will perhaps be found distinct from any of these.

ILLUSTRATIONS OF INDIAN BOTANY.

By Dr. Wight & G. A. W. Arnott, Esq.

(*Continued from page* 52.)

SESUVIUM REPENS.

TAB. XXIII.

Caulibus prostratis ad nodos radicantibus apicibus subascendentibus, foliis ovalibus carnosis spathulatis vel oblongolinearibus, floribus pedicellatis, stigmatibus 3.

Sesuvium repens. *Willd. Enum. p.* 521. *De Cand. Prodr. v.* 3. *p.* 453. *Spreng. Syst. Veget. v.* 2. *p.* 504. *Wall. Cat. n.* 3936. *Wight, Cat. n.* 1179. *Wight et Arn. Prodr. Ind. Or. v.* 1. *p.* 361.

Sesuvium Portulacastrum. *Roxb. Fl. Ind. v.* 2. *p.* 509. *Rumph. Amb. v.* 6. *t.* 72. *f.* 1.

Roots very long, fusiform. *Stems* herbaceous, numerous, jointed, round, smooth, red, rooting at every joint. *Leaves* opposite, nearly sessile, very fleshy, varying from orbicular to oblong-spathulate, or lanceolato-spathulate, and sometimes, though rarely, they are almost cylindrical: this last form is only observed when very luxuriant, and perhaps belongs to a different species: their usual size is about eight lines long, and four broad near the apex. The short *petioles* unite across the stem, and form a sheath round the joints. *Flowers* axillary, pedicelled, purplish externally, rosy within. *Calyx*, before expansion, conical, five-parted, the divisions imbricate and membranous on the edges, mucronate. *Corolla* none. *Stamens* numerous, attached to the edge of the tube of the calyx. *Filaments* and two-celled compressed *anthers* red. *Pistil,—Germen* three-celled, superior: *Styles* three, length of the stamens: *Stigmas* simple. *Capsule* three-celled, bursting all round: *Receptacle* central. *Seeds* numerous, obovato-orbicular, black.

Common in Tranquebar.

The specimens here figured grew in sand near the sea-beach, where it forms large tufts. All that is found there is very uniform in appearance, and is well represented in our drawing.

There is a very distinct variety, perhaps a species, seen on the turfy banks of salt water inlets, which attains a much greater size; the leaves being longer and narrower, the stems thicker and creeping to the extent of several feet; but, like this, rooting at the joints, and with pedicelled flowers.

The kind here figured being often buried under the loose sand, all except the tips of the leaves, in a short time, becomes blanched and tender. In this state it is much prized by swine! They seek after it so greedily that it is often difficult to procure a good specimen. I have never heard that man has shown a similar partiality to it. I have tasted it, and think it rather pleasant, except that it is too saline.

Fig. 1. Flower laid open. 2. Calycine leaf. 3. Pistil. 4. Capsule laid open. 5. Base of an old capsule surrounded by the persistent calyx:—*magnified*.

BOTANICAL INFORMATION.

We have the pleasure of announcing, that the second Fasciculus of the *Rev. M. J. Berkeley's* specimens of British Fungi is published, containing the following species:—

61. Agaricus piperatus, *Scop.*
62. Ag. Rotula, *Scop.*
63. Thelephora cinerea, *Pers.* (Fraxini.)
64. Thelephora cinerea, *Pers.* (Tiliæ.)
65. Thelephora acerina, *Pers.*
66. Typhula gyrans, *Batsch.*
67. Peziza fusarioides, *Berkl.*
68. Peziza atrata, *Pers.*
    (On *Spiræa Ulmaria.*)
69. Ascobolus Trifolii, *Bernh.*
70. Stictis radiata, *Pers.*
71. Exidia glandulosa, *Fr.*
72. Sclerotium complanatum, *Tode.*
73. Sclerotium Semen, *Tode.* (Brassicæ.)
74. Sclerotium durum, *Pers.*
75. Sclerotium medullare, *Berkl.*
76. Sph. carpophila, *Pers.* (junior.)
77. Sph. favacea, *Fr.*
78. Sph. velata, *Pers.*
79. Sphæria stellulata, *Fr.*
80. Sph. ambiens, *Pers.*
81. Sph. hypodermia, *Fr.*
82. Sph. arundinacea, *Sow.*
83. Sph. sanguinea, *With.*
    var. cicatricum, *Berkl.*
84. Sph. Corticis, *Sow.* (Fraxini.)
85. Sph. pruinosa, *Fr.*
86. Sph. atrovirens, *A. and S.*, γ Rusci, *Fr.*
87. Sph. Arundinis, *Fr.*
88. Sph. Angelicæ, *Berkl.*
89. Ceuthospora Lauri, *Grev.*
90. Phoma Hederæ, *Desm.*
91. Dothidea ribesia, *Fr.*
92. Dothidea typhina, *Fr.*
93. Phacidium dentatum, *Schmidt.*
94. Hysterium arundinaceum, *Schrad.*
95. Hysterium foliicolum, *Fr.*,
    γ maculare, *Berk.*
96. Erysiphe pannosa, *Schlecht.*

97. Polythrincium Trifolii, *Kze.*
98. Botrytis lateritia, *Fr.*
99. Trichothecium roseum, *Lk.*
100. Oidium leucoconium, *Desm.*
101. Psilonia gilva, *Fr.*
102. Psilonia Arundinis, *Desm.*
103. Fusarium tremelloides, *Grev.*
104. Næmaspora crocea, *Pers.* (sporidiifera.)
105. Aregma obtusatum, *Fr.*
106. Podisoma Juniperi communis, *Fr.*
107. Podisoma Juniperi Sabinæ, *Fr.*
108. Puccinia pulverulenta, *Grev.*
109. Puccinia Buxi, *Dec.*
110. Æcidium crassum, *Pers.*
111. Æcidium laceratum, *Sow.*
112. Æcidium Urticæ, *Dec.*
113. Uredo Caries, *Dec.*
114. Uredo urceolorum, *Dec.*
115. Uredo Potentillarum, *Dec.*
118. Uredo Lini, *Dec.*
119. Uredo excavata, *Dec.*
120. Uredo mixta, *Steud.*
117. 117.

116. Uredo apiculosa, *Lk.* sub Cæom. (Rumicum.)

117. Uredo apiculosa, *Lk.* sub Cæom. (Cichoracearum.)

67. Pez. fusarioides, *Berkl.* n. sp.

Erumpent, sessile, rather firm, smooth, depressed, orbicular or elongated, sometimes confluent, orange; margin thick, obtuse. *Berk. in Mag. of Zool. and Bot. v. I. p.* 46. *t.* 2. *f.* 4.

On dead stems of nettles, alone or in company with *Fusarium tremelloides.* Apethorpe, Norths. March—August.

75. Scler. medullare, *Berkl.* n. sp.

Inclosed, subglobose or oblong, black, at first brown, olivaceous-black within when fresh, at length (but rarely) erumpent and sinuous. *Berk. in Mag. of Zool. and Bot. v. I. p.* 47. *t.* 3. *f.* 5.

On decaying *Pteris aquilina.* King's Cliffe, Norths.

83. Sph. sanguinea, *With. var.* cicatricum, *Berkl.*

Crowded, very minute, subglobose, with a distinct obtuse short papilla, collapsed laterally when dry. *Berk. in Mag. of Zool. and Bot. v. I. p.* 48. *t.* 3. *f.* 6.

On dry twigs of Box. Apethorpe, Norths.

87. Sph. Arundinis, *Fr.*

Perithecia covered, suberumpent, globose, rugulose, black; ostiolum naked, compressed, thick, labiate. *Fr. in Myc. Heft.* 2. *p.* 55. *Sp. cristata, β. Arundinis, Pers. Syn. p.* 54.

On old stems of Reeds, especially towards the base, where they are frequently immersed in water. King's Cliffe, Norths. Asci clavate. Sporidia slightly curved, containing about five sporidiola as in *Platystoma.*

88. Sph. Angelicæ, *Berkl.* n. s.

Very minute, seriate; perithecia black, immersed, globose, furnished with a conical somewhat abrupt neck; ostiolum subobtuse; contents of the perithecia pale pink. *Berk. in Mag. of Zool. and Bot. v. I. p.* 48. *t.* 3. *f.* 7.

On dead, mostly decorticated stems of *Angelica sylvestris.* King's Cliffe, Norths. Spring.

102. Psilonia Arundinis, *Desm.*

Tufts dense, pale rose-coloured; flocci fasciculate, intricate, simple; sporidia ovate and oblong. *Desm. in Ann. des Sc. Nat.* 1830. *p.* 12. *t.* 5. *f.* 1. *Dub. Syn.* 2. *p.* 926.

On the sheaths of dead Reeds. King's Cliffe, Norths.

119. Uredo excavata, *Dec.*

Spots none or yellowish, sori scattered, surrounded by the inflated epidermis; sporidia brown, obovate, shortly pedunculate and sessile. *Dec. Fl. Fr. v. II. p.* 227. 6. *p.* 69. *Dub. Syn.* 2. *p.* 896. *Cæoma excavum, Lk.* 2. *p.* 34.

On *Euphorbia exigua* with *Æcidium Euphorbiæ* and *Uredo Euphorbiæ;* in the former case on the deformed leaves. King's Cliffe, Norths.

120. Uredo mixta, *Steud.*

Spots yellow; sori subrotund, confluent, effuse, bright yellow, surrounded by the ruptured epidermis; sporidia subrotund with a short peduncle and oblong-ovoid obtuse at either end. *Dub. Syn.* 2. *p.* 895. *Cæoma mixtum, Lk.* 2. *p.* 40.

On the leaves of various Willows. Barnwell, King's Cliffe, Norths.

All the copies of the First Fasciculus having been sold, the author has been induced to prepare a larger number of the present, and begs leave to inform such persons as may not object to commence with the second Fasciculus, that he is preparing a fresh supply of the First, which he hopes to have ready for delivery with Fasc. IV.

Fasc. III. will be published on March 1st, 1837.

I am indebted to a valued friend, now travelling on the continent, for some interesting particulars relative to Botany and Horticulture in some of the German towns; and the following extracts will, I doubt not, prove acceptable to our readers.

Berlin, July 31, 1836.

"We left England, as I intended, on the night between the 15th and 16th of this month, and arrived at Hamburgh early on the 18th. There we remained till Saturday, partly on account of the very bad weather, and partly because there is really very much beauty in some parts of the town; so that I had time to make repeated visits to the *Botanical Garden.* In point of situation it is, next to Edinburgh, the most beautiful one I know. It occupies about sixty English acres, of which the greater part is on the old outer ramparts of the town, planted with a good deal of taste. The old town ditch is here broad, and the water clear. The walks and plantations come down to the water's edge, and on the opposite side the bank is laid out as a promenade, with flower-beds, shrubs, and plantations, that conceal all the town, excepting the end of a very handsome new street, which, from several parts of the garden, looks like a fine château in an extensive park. The whole circuit of the ancient rampart of Hamburgh, is in the same manner converted into promenades full of flower-beds and of flowering shrubs neatly kept, and perfectly open to the high road, which has a beautiful effect, especially near the large lake, called the Alster. In a purely botanical point of view, the garden is chiefly rich in Cape plants, introduced by Mr. Ecklon, with a fair proportion of the Chilian and other new things which have been much raised of late in the German gardens, several very interesting Californian plants from the Petersburg garden,[1] and the ordinary quantum of ill-named, ill-defined *garden* species, which infest Continental, and especially German botanical gardens. Amongst the Cape plants, the most curious are the Palms, introduced by Ecklon, and published by Professor Lehmann, under the name of *Rakathia.* There are six or seven species, chiefly in small specimens: but amongst those received last December, there are two or three above eight feet high, that are now shooting leaves from the top. There is also a very extensive collection, lately introduced, of medicinal plants. The whole is kept up at the expense of the state or town of Hamburgh, and is open to the public nominally on certain days, at certain hours; but really all day and every day, without fee or other payment. It is under the immediate arrangement of an active and intelligent Curator, Mr. Ohlendorff, and under the general superintendence of the Professor, Dr. Lehmann, whom you know as well as myself, and who is now absent at the baths of Nassau. His Herbarium is deposited at the garden, and in his absence is shown by Mr. Sickmann, author of a list, lately published, of the plants found in the neighbourhood of Hamburgh. Lehmann's Herbarium includes that of the late Dr. Colsmann, of Copenhagen, in which are many of Thonning's Guinea plants. It is also rich in Ecklon's Cape plants, and contains a very good general collection, of considerable extent.

"Ecklon, the S. African traveller,[1] lives at the Botanical Garden, and is continuing the third part of his "*Enumeratio,*" which he intends publishing this autumn, previous to his departure for the Cape, where he purposes spending another twelvemonth.

"I missed at Hamburg, by a few days only, Dr. and Mrs. Fischer, of St. Petersburg, whom you will shortly see at Glasgow.

[1] These plants are described by the excellent Dr. Fischer, at the end of a "Catalogue of seeds of the Petersburg Garden," and are copied into the present volume of this Journal, p. 6.

[1] Some account of the Travels and Collections of this zealous Naturalist is given at page 171 of our "Journal of Botany." He has lately published the first and second Fasciculi of the "*Enumeratio Plantarum Africæ Australis extra-tropicæ, quæ collectæ, determinatæ et expositæ a Christiano Frederico Ecklon et Carolo Zeyher.*"

"Booth's Nursery at Flottbeck, near Hamburgh, continues to be the first in Germany, and has received much extension since I last saw it, especially in the houses. It contains, altogether, one hundred and five English acres at Flottbeck, and ten more at some distance. I was surprized to hear from Mr. Booth that a great part of his commerce is now with America. It is, however, the great entrepôt also of the nursery-garden commerce between Germany and England."

Dresden, August 15.

"Between Hamburgh and Berlin the country is wholly uninteresting to the Botanist, as the road lies the whole way across the sandy district that covers the whole of the North of Germany. As a Horticulturist, I would observe, that the palace-garden at Ludwigslust, like most palace-gardens in Germany, is beautifully laid out with well-kept walks, shady seats, flower-beds, &c., open at all times of the day to all descriptions of persons, upon the sole condition that they neither walk on the grass, gather the flowers, nor injure the trees, conditions that are religiously observed: and most delightful walks the palace-gardens generally are. At Berlin I spent ten days, chiefly devoted to Botany: for being anxious to examine some plants in the Royal Herbarium, and in that of M. Kunth, I acceded to their request of looking over and correcting the names of the *Labiatæ* in these the two principal Herbaria of the town.

"The Royal Herbarium is deposited at Schöneberg (a little village about three quarters of a mile from the gate of the town), opposite to the botanical garden, and in the garden of the Horticultural Society. It is contained in several rooms affording ample space for the collections, and in a situation where it would easily admit of additions, if necessary. It consists of,

1st, The *Willdenowian Herbarium.* This is arranged on paper of a size between that of the Linnæan (a small foolscap) and other old Herbaria, and the present usual size, such as yours and mine (sixteen and a-half inches long by ten and a quarter broad). Each specimen is fastened down by strips of paper to a single sheet, and all those that Willdenow had left under one cover, as one species, are carefully put together into a neat double sheet of blue paper. The labels, written by Willdenow, not having been attached by him to individual species, but left loose in the covers, have been fastened to the new covers, which have also a number, beginning from the commencement in the order of his species, and the individual sheets in each cover are also numbered: so that in referring to any specimen in the Herbarium, it is henceforth identified by quoting the number of the specific cover, and that of the sheet on the cover. I have been particular in describing this, because it appears to me to be the most useful way of preserving those Herbaria of distinguished Botanists which serve as authorities for their works, and would be far better than the slovenly manner in which Linnæus', Sibthorp's, and others of our *Herbier's types* are allowed to remain. As to the plants themselves in Willdenow's Herbarium, there are, perhaps, not quite so many as one might have expected: often bad specimens; and unfortunately, in many instances, additional specimens have been thrown into the old covers by him without examination, and the labels mixed, so that it would require much caution in ascertaining which was the individual specimen the author had in view. But it is very valuable in containing nearly the whole of the plants he described from the Berlin garden, as well as the Oriental plants described in his "Species Plantarum," from Gundelsheimer's and Tournefort's specimens, and the Siberian ones from Stephen:—the latter are beautiful specimens, and some of them little known, even now, by Russian Botanists. This Herbarium also contains a tolerable set of Humboldt's plants.

2ndly, The *General Herbarium.* This comprehends a rather rich German and garden collection, a complete set of Sieber's specimens, the Wallichian East Indian plants, and some others brought by Kunth when he came over for that purpose to England; some Cape plants, to which, I believe,

are now added Ecklon's; but above all, complete sets of Schiede and Deppe's Mexican, and Sellow's Brazilian plants. What are most wanting are North and West American, Australian, and Asiatic plants. This and the following collection are arranged according to the Natural Orders.

3rdly, The separate *Sellowian Herbarium,* which on account of the size of its specimens, is kept in larger paper, and still contains, in several instances, numerous duplicates, which, according to the liberal system now adopted, are to be given away to such Botanists as have contributed, or may be expected to contribute, to the general Herbarium:—or to Monographists to whom particular series are valuable. There are also Cryptogamic collections, and some others of minor importance.

"Of the two friends whom I formerly saw here in the immediate management of this Herbarium, the one, M. de Schlechtendal, is now Professor of Botany at Halle, where he continues the publication of the "Linnæa;" the other, poor Chamisso, is, I fear, on his death-bed. He has been for many months in a state which leaves no hope of his recovery. The present management is in the hands of your friend Klotzsch, who has been exceedingly kind and attentive to me, and who seems quite happy on a very small salary. Under him is a very active old man, of the name of Tiel, who has a considerable knowledge of plants, especially such as is necessary for keeping them in a good state of arrangement, which is no slight merit,—and one or two other assistants.

"In the same building with the General Herbarium, is an extensive collection of seeds and fruits, the smaller ones all in glass bottles, labelled and classed; and a library of the more usual botanical works. The larger and more costly works are in the public library in the town, to which I shall advert by-and-bye."

Dresden, August 17, 1836.

"The other important Herbarium in Berlin, is that of Mr. Kunth, which is rich chiefly in the Humboldtian plants, Michaux's North American, Olivier's Oriental, and others which he brought with him from Paris; a considerable Europæan collection, the Wallichian and other plants he received in England, Beyrich's American, Meyer's and also Lessing's Siberian, Sellow's Brazilian, and various other collections which he has lately obtained from different quarters: and, as a general Herbarium, it may probably be more extensive than the royal one of Schöneberg. It is kept entirely in the French manner:—the specimens are loose in separate leaves, each species in one cover, and the whole tied up in bundles;—a very good way when there is abundance of room, and when it is not necessary to consult them frequently: but it would be reckoned with us a great waste of space and time. M. Kunth himself, who was most friendly and serviceable to us, is at this time much engaged with the *Cyperaceæ,* which are printing for his "*Enumeratio,*" and upon which he has published some memoirs in Wiegmann's *Archiv. der Naturkund,* as well as in the memoirs of some public bodies. He has extensive materials before him for his work, and is bestowing great pains upon it.

The Botanical Garden of Berlin remains under the immediate management of Messrs. Otto, father and son; and is, I believe, still the most important in Germany, in the number of species (trees excepted, in which respect the Vienna Garden excels). Our Californian plants thrive remarkably well, and they have a great many things also from the Petersburg Garden, chiefly from the same country, and some of them very ornamental. The foreman in the houses is a Scotchman from Dr. Neill's garden, who takes a great interest in the establishment, and is a very intelligent man.

Professor Link, who has a superior control over the garden, is deeply engaged with physiological Botany. He intends publishing a new edition of his *Philosophia Botanica;* and as a separate work, but in illustration of it, he is preparing some plates to be published under the title of *Icones Anatomico-botanicæ.* They are drawn and engraved under his own eye,

by a young man who is a clever draughtsman. Link is decidedly a man of great genius, who has observed much and well, not only in his study at home, but during the almost annual excursions he makes to the southward, to Spain, Italy, Greece, &c. At a party assembled at Professor Kunth's, he drew round him a circle of listeners, and entertained us the whole evening by his lively conversation.

Professor Meyer, of whose *Voyage round the World* you may have seen the two first volumes, containing the historical narrative with short accounts of several new plants and animals, is now married and settled here. He has very lately completed and published the third volume of his work, containing the Zoology, and is now occupied with the fourth or botanical portion. He has brought with him a considerable number of plants, chiefly from Chili and Peru, from the Sandwich Islands, from Manilla, and from Macao. The most curious are the Peruvian ones, in which country he ascended one of the high mountains. He gave me a set of his *Labiatæ* and *Scrophulariæ* and a few of the Peruvian alpine plants, which were new to me. He is also, as almost all the Botanists here, engaged at the same time with physiological Botany, and especially on the subject of the external glands of plants, on which he is preparing a memoir, illustrated with some very good drawings.

"Professor Ehrenberg, the Egyptian traveller, has now quite given up Botany for microscopical Zoology, and is at this time following up his discovery of fossil animalcules, on which subject his works are highly esteemed here.

"A young man of the name of *Vogel* is at work on *Leguminosæ*. He has published in the last number of the *Linnæa* those of Chamisso's Voyage, amongst which you will see a new Californian genus allied to *Hosackia*. It is my *Hosackia juncea*, which you thought nearer *Indigofera*. Mr. Vogel, who had not yet seen my memoir on *Hosackia*, considered the fruit (which I had not seen) to justify the establishing a new genus. He may be right. He is now working upon Sello's *Leguminosæ*.

"I should here mention a young man who, though now absent, is much spoken of at Berlin, and thought highly of by M. De Humboldt. I mean Corda, who has made numerous physiological observations and drawings. He was living in great distress at Prague, when M. De Humboldt, struck by some of his observations on *Cycadeæ* and *Coniferæ*, invited him to come to Prussia to examine and figure the *Cycadeæ* in the new Palm-house in the Pfauen Insel, and, since that, Count Sternberg has procured him a situation at Prague, by means of which he can support himself, but is still unable to publish much of the result of his microscopical observations, which M. de Humboldt speaks of as highly important, especially as illustrating the currents and molecular motions in living plants. I mentioned above, Wiegmann's *Archiv. der Naturkund.* It is a bimestrial periodical, of the size of the Linnæa, chiefly devoted to Zoology, but which frequently contains also botanical papers, a very inconvenient arrangement both for Botanists and Zoologists.

On leaving Berlin we stopped for a couple of hours at the lovely Pfauen-Insel, or Isle of Peacocks, in the Havel near Potsdam. It is near an English mile long, and belongs to the king, who has a curious kind of pied-a-terre, or shooting box, on it, and is laid out partly as a zoological, partly as a botanical garden. In the former department the animals are more remarkable for their fine state of health than for their number or variety. In the botanical department, the Palm-house, built in 1830, to receive the Palms bought by the king at Paris, is very handsome, not perhaps so much for its exterior form, as for the interior arrangement. In the centre is a *Latania* in full vigour, above thirty feet in diameter in the spread of its foliage. The remainder is occupied by many fine *Palms, Cycadeæ, Bambusas, Dracænas*, &c. interspersed with lower plants: and what adds much to the beauty, is, the very tasteful manner in which the *Passiflora*

quadrangularis, racemosa, kermesina, and other flowering creepers, are made to hang in festoons wherever the want of taller palms leaves a vacancy. The garden is under the care of Mr. Fintelmann, the nephew of the older Fintelmann, who is removed to the royal gardens of Charlottenburg, and has taken with him the fine collection of Dahlias which used to be at the Pfauen Insel.

At Leipzig I spent a day with Professor Pœppig, the South American traveller; he is a very agreeable, gentlemanly man, speaks English well, and his account of his journey is reckoned (as M. de Humboldt told me) a beautiful specimen of German writing. He is professor of Zoology at the University of Leipzig, and therefore is giving up Botany in a great measure. Endlicher of Vienna is publishing his plants, but Dr. Pœppig complains with regret of the slow manner in which the work goes on, owing to the number of other works in which Endlicher is engaged. Pœppig speaks with great delight of the wild independent life he led in S. America, and lays much stress on the despondency he felt when obliged to return to Europe—a feeling which in a similar case led another eminent traveller to destroy himself: but now M. Pœppig is married and settled here, and says he has no desire to go back. I saw also Dr. Kunze, who is very busy with Ferns. He has had several engraved, which he is about to publish in a work which is to contain merely figures and descriptions of Ferns.

"I was too short a time at Leipzig to see Dr. Schwägrichen, or the botanical garden, which, I am told, is of very little importance.

"Here at Dresden I had the good fortune of meeting M. de Humboldt, but as I am at the end of my paper, I must leave the rest till my next, which I hope to send from Munich."

Dr. Alexander Murray has long been collecting materials for a work entitled, "*The Northern Flora;* or, a Description of the wild plants belonging to the North and East of Scotland, with an account of their places of growth and their properties." Of this, the first part has just appeared, including the Linnæan Classes Monandria to Tetrandria and part of Pentandria. The object of the author in regard to this publication is best explained by a few extracts from the Preface:—"The tract of country which is at present in view, may be supposed to be separated from the rest of the island, by an irregular boundary, stretching from the Forfarshire coast on the east, to that of Sutherland on the west; and may, in a general way, be said to consist of that portion of the East and interior of Scotland, which lies to the north of Montrose, in addition to the western part of the county of Sutherland. This district may be considered as consisting of two great promontories, each making a degree of approach to the peninsular form; one of these a large, and, for the most part, a rather level district; the other, mainly a rugged alpine region. Though it is, therefore, to be understood, that no profession is strictly made of the present publication reaching beyond Montrose; yet frequent references are made to situations still further to the South, and an expectation has sometimes been indulged that, with the aid of a little supplementary matter, which, on various accounts, it may be necessary to give at the conclusion, this Flora will be found to suit any part of the east of Scotland northward of Dundee."

"The object, in short, has been to offer an account of the native vegetation of the tract referred to, which might afford to those residing within it, the means of acquiring a knowledge of the native plants they may expect to find, without the evident and well known inconvenience arising from the extraneous matter, occurring, of necessity, in works of a more general character; while, at the same time, a knowledge of our indigenous species might be imparted to others at a distance, who are interested in such matters.

"The method which has been followed may, as a whole, be considered new, and is therefore deserving of a brief explana-

Mr D[illegible]ID DOUGLASS.

Lithographed for the
Companion to Curtis's Botanical Magazine.

R. Martin & Co. 26, Long Acre.

tion. In the first place it may, without technical language, be observed, regarding the present descriptions of plants, that in place of the usual method, wherein the strict characters of species are succeeded by a detailed account, or at least by any supplementary matter which appears necessary, it has been endeavoured, in one brief description, to combine the characters necessary for distinguishing the species from one another, with any other points which may be deemed useful or interesting. There is also, for the most part, a paragraph, entitled "Observations," annexed to each genus, wherein the more tangible points of difference among its species are noticed, along with any other remarks appearing to deserve attention, and which have suggested themselves. And when the genus is long, it is subdivided into sections or groupes, each of which is followed by the *observations* alluded to. It should also be mentioned that, when the name made use of by Linnæus, or in the more common of our British works, differs from the specific appellation which the author has adopted, the corresponding synonym is mentioned."

A BRIEF MEMOIR OF THE LIFE OF MR. DAVID DOUGLAS, WITH EXTRACTS FROM HIS LETTERS.

(*Accompanied by a portrait.*)

It is not willingly that the following record of the successful labours of Mr. David Douglas in the field of Natural History, and of his lamented death, has been so long withheld from the public: a circumstance the more to be regretted, because his melancholy and untimely fate excited a degree of interest in the scientific world, which has been rarely equalled, especially towards one who had hitherto been almost as unknown to fame as to fortune. But the writer of this article was anxious to satisfy public curiosity by the mention of some further particulars than what related merely to Mr. Douglas's botanical discoveries; and this could scarcely be done but through the medium of those friends whose personal acquaintance was of long standing, and especially such as knew something of his early life. This has at length been accomplished, through the kindness of Mr. Douglas's elder brother, Mr. John Douglas, and of Mr. Booth, the very skilful and scientific gardener at Carclew, the seat of Sir Charles Lemon, Bart. It is to Mr. Booth, indeed, that I am indebted for almost all that relates to the subject of this memoir, previous to his entering the service of the Horticultural Society, and for the copies of some letters, as well as several particulars relative to his future career.

David Douglas was born at Scone, near Perth, in 1799, being the son of John Douglas and Jean Drummond,[1] his wife. His father was a stone-mason, possessed of good abilities, and a store of general information, rarely surpassed by persons in his sphere of life. His family consisted of three daughters and as many sons, of whom the subject of this notice was the second. At about three years of age he was sent to a school in the village, where the good old dame,

> "Gentle of heart, nor knowing well to rule,"

soon found herself mastered by her high-spirited little scholar, who

> "Much had grieved on that ill-fated morn,
> When he was first to school reluctant borne,"

and took every opportunity of showing his dislike to the restraint, by playing truant, or defying the worthy lady's authority. At the parish-school of Kinnoul, kept by Mr. Wilson, whither he was soon sent, David Douglas evinced a similar preference to fishing and bird-nesting over book-learn-

[1] It is not a little remarkable, that the mother of Mr. Douglas should have borne the same name with that of another enthusiastic Naturalist, who nearly at the same age, and after devoting a similar number of years to scientific researches upon the same vast Continent of North America, met with an untimely grave, soon after arriving at a neighbouring island, almost at the very same period as the subject of this memoir. It will be at once seen that I allude to Mr. Thomas Drummond.

ing; he was often punished for coming late, not knowing his lessons, and playing the truant; but no chastisement affected him so much as the being kept in school after the usual hour of dismissal. His boyish days were not remarkable for any particular incidents. Like others at his time of life, he was lively and active, and never failed of playing his part in the usual sports of the village; a taste for rambling, and much fondness for objects of Natural History being, however, very strongly evinced. He collected all sorts of birds, though he often found it difficult to maintain some of these favourites, especially the hawks and owls. For the sake of feeding a nest of the latter, the poor boy, after exhausting all his skill in catching mice and small birds, used frequently to spend the daily penny with which he should have procured bread for his own lunch, in buying bullock's liver for his owlets, though a walk of six miles to and from school, might well have sharpened his youthful appetite. He was likewise much attached to fishing, and very expert at it, and when he could not obtain proper tackle, had recourse to the simple means of a willow-wand, string, and crooked pin, with which he was often successful. From his earliest years, nothing gave Douglas so much delight as conversing about travellers and foreign countries, and the books which pleased him best were Sinbad the Sailor and Robinson Crusoe. The decided taste which he showed for gardening and collecting plants, caused him to be employed, at the age of ten or eleven years, in the common operations of the nursery-ground, attached to the gardens of the Earl of Mansfield, at Scone, under the superintendence of his kind friend and master, Mr. Beattie, with the ultimate view of his becoming a gardener. Here his independent, active, and mischievous disposition sometimes led him into quarrels with the other boys, who, on complaining of David to their master, only received the reply, "I like a deevil better than a dult," an answer which showed that he was a favourite, and put a stop to further accusations. In the gardens of the Earl of Mansfield he served a seven years' apprenticeship, during which time it is admitted by all who knew him, that no one could be more industrious and anxious to excel than he was, his whole heart and mind being devoted to the attainment of a thorough knowledge of his business. The first department in which he was placed was the flower-garden, at that time under the superintendence of Mr. M'Gillivray, a young man who had received a tolerable education, and was pretty well acquainted with the names of plants and the rudiments of Botany. From him Douglas gathered a great deal of information, and being gifted with an excellent memory, he soon became as familiar with the collection of plants at Scone as his instructor. Here the subject of this notice found himself in a situation altogether to his mind, and here, it may be said, he acquired that taste for botanical pursuits which he so ardently followed in after life. He had always a fondness for books, and when the labour of the day was over, the evenings, in winter, invariably found him engaged in the perusal of such works as he had obtained from his friends and acquaintance, or in making extracts from them of portions which took his fancy, and which he would afterwards commit to memory. In summer, again, the evenings were usually devoted to short botanical excursions, in company with such of the other young men as were of a similar turn of mind to himself, but whether he then had any intention of becoming a botanical collector, we have now no means of ascertaining. He had a small garden at home, where he deposited the living plants that he brought home. It may be stated that these excursions were never pursued on the Sabbath-day, his father having strictly prohibited young Douglas doing so, and this rule he at no time broke. The hours which might be called his own, were spent in arranging his specimens and in reading with avidity all the works on Travels and Natural History, to which he could obtain access. Having applied to an old friend for a loan of some books on these subjects, the gentleman (Mr. Scott)

to David's surprise, placed a Bible in his hands, accompanied with the truly kind admonition, "There, David, I cannot recommend a better or more important book for your perusal."

It has frequently occurred to us, when admiring the many beautiful productions with which the subject of this memoir has enriched our gardens, that, but for his intercourse with two individuals, Messrs. R. and J. Brown of the Perth Nursery, these acquisitions, in all probability, would have been

"The flowers on desert isles that perish."

At this period of Douglas's life, these gentlemen were very intimate with Mr. Beattie, and their visits to Scone afforded opportunities to him to gain their acquaintance. Both were good British Botanists, and so fond of the study, as annually to devote a part of the summer to botanizing in the Highlands; hence their excursions were often the subject of conversation, and it is believed, that from hearing them recount their adventures, and describe the romantic scenery of the places they had visited in search of plants, Douglas secretly formed the resolution of imitating their example.

Having completed the customary term in the ornamental department, he was removed to the forcing and kitchen garden, in the affairs of which he appeared to take as lively an interest as he had previously done in those of the flower-garden. *Lee's Introduction to Botany*, and *Donn's Catalogue*, his former text-books, if they may be so termed, were now laid aside, and *Nicol's Gardener's Calendar* taken in their stead. The useful publications of Mr. Loudon, which ought to be in the hands of every young gardener, had not then made their appearance; so that his means of gaining a *theoretical* knowledge of his business were very limited, when compared with the facilities of the present day: but, what was of more consequence to one in his situation, he had ample scope for making himself master of the *practical* part, and it is but justice to state that, when he had finished his apprenticeship, he only wanted age and experience in the management of men, to qualify him for undertaking a situation of the first importance.

His active habits and obliging disposition gained the friendship of Mr. Beattie, by whom he was recommended to the late Mr. Alexander Stewart, gardener at Valleyfield, near Culross, the seat of the late Sir Robert Preston, a place then celebrated for a very select collection of plants. Thither David Douglas went in 1818, after having spent the preceding winter months in a private school in Perth, revising especially such rules in arithmetic as he thought might be useful, and in which he either had found or considered himself deficient. He was not long in his new situation when a fresh impulse seized him. The kitchen garden lost its attraction, and his mind became wholly bent on Botany, more especially as regarded exotic plants, of which we believe one of the very best private collections in Scotland was then cultivated at Valleyfield. Mr. Stewart finding him careful of the plants committed to his charge, and desirous of improvement, encouraged him by every means in his power. He treated him with kindness and allowed him to participate in the advantages which he himself derived from having access to Sir R. Preston's botanical library, a privilege of the utmost value to one circumstanced like Douglas, and endowed with such faculties of mind and memory as he possessed. He remained about two years at Valleyfield, being foreman during the last twelvemonth to Mr. Stewart, when he made application and succeeded in gaining admission to the Botanic Garden at Glasgow. In this improving situation it is almost needless to say, that he spent his time most advantageously and with so much industry and application to his professional duties as to have gained the friendship and esteem of all who knew him, and more especially of the able and intelligent Curator of that establishment, Mr. Stewart Murray, who always evinced the deepest interest in Douglas's success in life. Whilst in this situation he was a

diligent attendant at the botanical lectures given by the Professor of Botany in the hall of the garden, and was his favourite companion in some distant excursions to the Highlands and islands of Scotland, where his great activity, undaunted courage, singular abstemiousness, and energetic zeal, at once pointed him out as an individual eminently calculated to do himself credit as a scientific traveller.

It was our privilege, and that of Mr. Murray, to recommend Mr. Douglas to Joseph Sabine, Esq., then Honorary Secretary of the Horticultural Society, as a Botanical Collector; and to London he directed his course accordingly, in the spring of 1823. His first destination was China, but intelligence having about that time been received of a rupture between the British and Chinese, he was despatched, in the latter end of May, to the United States, where he procured many fine plants, and greatly increased the Society's collection of fruit-trees. He returned late in the autumn of the same year, and in 1824, an opportunity having offered through the Hudson's Bay Company, of sending him to explore the botanical riches of the country in North-West America, adjoining the Columbia River, and southward towards California, he sailed in July for the purpose of prosecuting this mission.

We are now come to the most interesting period of Mr. Douglas's life, when he was about to undertake a long voyage, and to explore remote regions, hitherto untrodden by the foot of any Naturalist. In these situations, far indeed from the abodes of civilized society, frequently with no other companion than a faithful dog, or a wild Indian as a guide, we should have known little or nothing of his adventures, were it not for a Journal which he kept with great care, (considering the difficulties, not to say dangers, which so frequently beset him in his long and painful journeyings,) and which has been deposited in the library of the Horticultural Society of London. From that Journal is here selected whatever is likely to prove interesting to our readers: and these extracts, with some occasional observations and extracts from the few letters that were received by his friends during the continuance of this mission, will prove more than any language we can employ, Mr. Douglas's high qualifications as a Naturalist and Traveller.

A SKETCH OF A JOURNEY TO THE NORTH-WESTERN PARTS OF THE CONTINENT OF NORTH AMERICA, DURING THE YEARS 1824, 5, 6, AND 7.

By David Douglas, F.L.S.

WHILE so much geographical information has, of late years, been added to the general stock of knowledge, and so many distinguished individuals have assiduously devoted their talents to the investigation of the northern parts of this country, the Horticultural Society of London, desirous of disseminating among the gardens of Britain the vegetable treasures of those widely-extended and highly diversified countries, resolved on sending a person experienced in the modes of collecting and preserving botanical subjects, and of transmitting seeds to England. I had the pleasure of being the individual selected, having previously extensively travelled on the eastern parts of the same Continent for a similar purpose. Before entering on this brief statement, I must beg leave to return my grateful thanks to John Henry Pelly, Esq., Governor, and Nicholas Garry, Esq., Deputy Governor of the Honourable the Hudson's Bay Company, for the kind assistance I, on all occasions, experienced at their hands, and for much valuable information received both before and after my arrival in England. To the enlightened zeal with which these gentlemen forward every enterprize for the advancement of Science, and to the warm interest they always showed on my behalf, I am happy to have this occasion of bearing my grateful, though feeble testimony. I also beg leave to thank the different residents, partners, and agents of this Company, both individually and collectively.

I embarked on Sunday, the 25th of July, on board the Hudson's Bay Company's

Brig, William and Ann, Captain Henry Hanwell, destined for the entrance of the River Columbia. To beguile the monotony attending long voyages, I held myself fortunate in having a companion in Dr. Scouler[1] of Glasgow, a man skilled in several, and devotedly attached to all, branches of Natural History, a pupil of Dr. Hooker, by whom he was powerfully recommended to the H. B. C. as surgeon to the vessel, in order that he might have an opportunity of prosecuting his favourite pursuit. A few days of favourable weather carried us clear of the shores of England, and on the 9th of August we passed the high grounds of the Island of Porto Santo, and anchored on the following afternoon in the Bay of Funchal, Madeira. So far as the experience of a two days' visit went, I was much gratified with this delightful island. My companion and I visited the summit of one of the highest mountains, stocking our Herbaria with several interesting, though not new plants; we also walked into the vineyards in the neighbourhood of the town, saw the hospital, churches, and other establishments, and resumed our voyage on the 12th of August towards Rio Janeiro. As we approached the Equator, the temperature increased, its greatest height being 84° in the shade at 3 P. M. on the 21st, and its minimum 59°. The mornings were peculiarly pleasant and fine. Near the Cape de Verd Islands, the *Exocœtus volitans* was frequently seen, skimming from wave to wave, and sometimes dropping on the deck of our vessel, which lay very low in the water: the screaming noise of *Phaeton æthereus* and the never absent *Procellaria pelagia*, or *Mother Cary's Chicken*, formed the only alleviation to the monotony of sky and water. For ten degrees on each side of the Line, the weather was very variable, sometimes calm, sometimes with thunder and lightning, and sudden gusts of wind, which rendered this part of our voyage somewhat tedious. We, however, arrived within sight of Cape Frio on the 26th of September. Towards evening the ship was surrounded by a vast variety of sea-birds, and I saw, for the first time, the Albatross, *Diomedea exulans*.

The magnificent prospect of the harbour of Rio is well known. One feature in Brazilian scenery which particularly strikes the European eye is, that the Palms always grow largest on the summit of the highest hills. During my stay, I had the pleasure to become known to William Harrison, Esq., residing at Botofogo, through whose instrumentality many beautiful plants[2] have been introduced to England, and who bestows great pains on collecting subjects in other departments of Natural History, illustrative of Brazil. In company with this gentleman and his relation, Mr. Henry Harrison, I made a short journey to the interior, where I was excessively gratified with the rich luxuriance of the forest, though the season was too early to display it in all its glory, and particularly delighted with the curious and endlessly varied forms of the *Orchideæ*. Mr. Harrison cultivates with great success about seventy species of this family of plants, by simply nailing them to the garden-wall, and giving them the assistance of the bark or wood whereon they naturally grew, to aid them in climbing and supporting themselves. He possesses also an aviary, containing several rare and beautiful native birds.

I also made the acquaintance of the late John Dickson, Esq. surgeon, R.N., who was never so happy as when he had the opportunity of doing any act of kindness. On the 15th of October, I quitted this charming place with much regret, increased by having been scarcely able to add any dried plants to my collection, owing to the earliness of the season and the continued rain. For a few days, until we got clear of land, the weather was changeable, accompanied by wet in the evenings.

At four A. M. on Tuesday, the 19th Oct., a fine breeze sprang up, and we bore away for the South, gradually leaving the fine

[1] Lately Professor of Natural History in the Andersonian University, Glasgow; and now Professor of Geology in the Royal Dublin Institution.

[2] Of these, especially the Epiphytes, a very great number have been figured in the Botanical Magazine and Register.

weather. Off the River Plata, in lat. 37° South, long. 37° West, immense shoals of *Fucus pyriformis* passed the ship, some specimens of which measured sixty feet in length, with a stem, at the thickest part, of three inches diameter. On the root was a variety of *Asterias, Beroe,* and other *Molluscæ.* In this parallel, *Procellaria Capensis* and *P. fuliginosa* began to be common, and I captured several with a small hook and line. In passing between the main land and the Falkland Islands, Nov. 5, an indescribable and piercing chillness told us we were drawing near the dreary and inhospitable regions of Cape Horn, of which in a few days longer we became fully aware.

While within the parallels of 50° and 59° S. lat., I caught sixty-nine specimens of *Diomedeæ,* consisting of *D. exulans, fuliginosa,* and *chlororhynchos:* the last, though a smaller bird than the first, reigns lord paramount over the rest, and compels them all to flee at his approach. It is stated by most authors that these birds are taken with the greatest ease during calm weather, but I have invariably found the reverse to hold good; it was only during the driving gusts of a storm that I could secure them, and on such occasions they fight voraciously about the bait, the hook often being received into the stomach. The appearance of these birds is grand and majestic; the largest which I ever saw measuring twelve feet four inches, from tip to tip of the extended wings, and four feet from the point of the beak to the end of the tail. As respects their flight, the same remarks apply to all the species. When sitting on the water, their wings are raised exactly like a swan; when feeding they are somewhat higher, with a constantly tremulous motion like those of the hawk tribe; and when elevating themselves from the water to soar in the air, they first walk the water, skimming the surface with the points of their pinions for the distance of several hundred yards, before they seem able to raise themselves, which they finally do with the utmost grace, and with scarcely any apparent movement of their wings. They are of a bold and savage disposition, which is especially displayed when they are captured.

Of *Larus* and *Procellaria* I caught many by the same means—a hook baited with fat pork. In these latitudes a white-striped porpoise was observed, of smaller size, but equal velocity in its motions with the common one. Till we passed the 50° parallel of S. latitude on the Pacific side of the Continent, we were subject to boisterous weather, high seas, hail, rain, and thick fogs. On the 14th of December, the island of Massafuera was distinctly seen, distant seven leagues, appearing like a dark bare rock. We passed near enough to ascertain that it was far from being fertile, though a little verdure might be descried in the valleys, with some stunted trees on the hills, and a few goats browzing on the rocky clefts. A high surf breaking on the beach prevented a boat from being sent on shore, and we consequently bore away for the island of Juan Fernandez; the wind failing, however, we did not reach it till ten days afterwards. This classic island,* which might be properly termed the Madeira of the southern hemisphere, is very mountainous and volcanic; its hills beautifully clothed with verdure to their summits, which, except in very clear weather, are enveloped with clouds, the scorched and rocky soil, admirably contrasting with the deep green of its lovely vegetation. On the second day we landed in Cumberland Bay, so named by Anson, in 1741. As we approached the shore, we were surprised to observe a small vessel, lying in the Bay, and on the beach a little hut, with smoke rising from it. When on the point of stepping from the boat, a man, to our astonishment, sprang from the bushes and directed us to a sheltered creek. He gave us the following account of his adventures. His name is William Clark, a native of Whitechapel, London, and being a sailor, came to the coast of Chili about five years ago, in a Liverpool vessel, called Solland, and was there discharged. He is now in the employment of the Spaniards, who visit Juan Fernandez for the purpose of killing seals and wild cattle, both of which

are plentiful. His companions, five Spaniards, were on the other side of the island, following their customary pursuit, and came to see him once a-week, during which time he was left to take charge of the little bark and other property. The poor fellow, when he first observed us, took us for pirates, as we were all armed, and abandoning his hut, fled to the woods, but hearing us speak English, he sprang from his retreat and welcomed us with a pleasure which it would be difficult to describe. He had spent five weeks here, and meant to stay about as much longer. His clothing consisted of a pair of coarse woollen trousers, of which it would be hard to detect the original material and colour, with a cotton and a flannel shirt, and a hat (he preferred, however, going bareheaded), but no coat. The surgeon and I gave him all that we could spare from our own slender stock, for which he was very thankful. His little hut was built of stones and turf, thatched with the straw of the wild oat. In one corner lay a bundle of straw and his blanket; a log of wood to sit upon composed all the furniture. His only cooking utensil was a common cast-iron pot, with a wooden bottom, in which he boiled his food by sinking it a few inches in the floor of his dwelling, and placing the fire round the sides. He longed to taste roast beef (having had none for seven years), and one day tried to bake some, as he termed it; but the bottom of his culinary apparatus, as might be expected, gave way in the process, so that poor Clark was unable to accomplish his new fashion of preparing the national dish.

It was agreeable to find that this poor exile possessed a good deal of information; his library amounted to seventeen volumes, —a Bible and Common Prayer-Book, which he kept concealed in a secret place when his Spanish companions were with him; some odd volumes of Tales of my Landlord and Old Mortality; several of Voyages; and Cowper's Poems, out of which he had learnt by heart the one upon Alexander Selkirk; and what is still more worthy of notice, a finely-bound copy of Robinson Crusoe, of which the poor fellow might himself be considered the latest and most complete edition. Like most English sailors, he had no aversion to rum; I gave him a single dram, which, as he had been long unaccustomed to it, made him forget his exile, and like the heroes of Troy,

> " He fought his battles o'er again,
> And slew the slain three times."

A few years ago the Spaniards formed a colony here, but it is now abandoned, the houses and fort are destroyed, and twenty-six pieces of large cannon lay upon the beach. The vestiges of a church are still to be seen, with the following inscription upon the lintel of the door—" La casa de Dios es la puerta del cielo, y se colocada, 24 Septembre, 1811."—The house of God is the gate of heaven, built 24 Sept. 1811. Near this is a circular oven, built of London fire-brick, seven feet in diameter within, bearing a date 1741, and therefore probably built by Anson during his residence. Some pigeons, of a small blue species, now occupy it as their cote. There were eggs in, but no young ones; I pointed it out to Clark, and advised him to make use of this colony. In the old gardens were *Peaches* of three or four sorts, growing luxuriantly with fruit about half ripe; *Quinces*, *Apples*, and *Pears*. We took some of these fruits for puddings, with abundance of *Figs* in a vigorous state of bearing. *Vines* thrive well, and were in blossom. The only fruit which was, however, in perfection, was a large, pale-reddish *Strawberry*, of which the fruit had a not unpleasant flavour; the leaves, stem, and calyx very downy. I dried a paper full of its seeds, lest the species should prove indigenous to this island or the coast of Chili.

Before leaving Juan Fernandez, I sowed a small quantity of *Vine*, *Pears*, and other fruit-seeds which I had brought with me, and a portion of culinary vegetables, leaving some with Clark, whom I recommended to try them in various parts of the island, as radishes were the only vegetable he had. We spent part of a day in fishing, and caught a sort of rock cod and a smaller fish, which was unknown to me,

both were good eating. On quitting the shore, Clark presented us with a fine female goat (not, however, one that had belonged to Robinson Crusoe, as it was quite young); we left him standing on a large stone on the beach, expecting to see us again the next morning, but hardly had we reached the ship, when a strong easterly wind set in, and we were speedily carried far from that enchanting spot, and from my new and interesting acquaintance, Clark. No pen, indeed, can correctly describe the charming and rural appearance of this island;[1] the numerous rills descending through the valleys, overshadowed by luxuriant verdure, and terminating in dark recesses and rocky dells, where wave the feathery fronds of *Lomatia*, *Aspidia*, and *Polypodia*, several species of which are new and of truly princely form and growth. On the hills grow several kinds of *Escallonia*, *Berberis*, *Lobelia*, *Hordeum*, and *Avena*. During my short stay I gathered seventy distinct and highly interesting plants. The species of Birds were few, and not beautiful; I killed a *Strix*, and several of a dark kind of *Columba*, which is very abundant.

Our course was then directed to the Gallipagos, lying under the Equator, in long. 80° West, which we pleasantly gained on the 9th January, 1825, having kept our Christmas-day in lat. 37°, S. long. 84° West, by feasting on the goat which Clark had given us, and drinking the health of our friends in England. The heat is by no means so oppressive in the same latitude on the Pacific as the Atlantic Ocean, for though the difference in the mercury is trifling, there is a cooling breeze which always renders the air agreeable. We passed along the East side of Chatham Island, which is mountainous, and apparently bare of vegetation; and went on shore the following day on James's Island, about thirty-seven miles further West. The whole of the Gallipagos are mountainous and volcanic, with vestiges of many craters, covered with lava, but the hills do not seem to exceed two thousand feet above the level of the sea. Their verdure is scanty, as compared with most tropical countries, owing, apparently, to the parched nature

[1] Mrs. Maria Graham (now Mrs. Callcott) gives a no less charming account of Juan Fernandez, and the view from her talented pencil engraved in her "*Journal of a Residence in Chili*," bears her out in her description. "It is," she says, "the most picturesque place I ever saw, being composed of high perpendicular rocks, wooded nearly to the top, with beautiful valleys; and the ruins of the little town in the largest of these heightens the effect. It was too late to go ashore when we anchored; but it was bright moonlight, and we staid long on the deck at night, admiring the extraordinary beauty of the scene."—"The valleys are exceedingly fertile, and watered by copious streams, which occasionally form small marshes, where the *Panke* grows very luxuriantly, as well as water-cresses and other aquatic plants. The little valley where the town is, or rather was, is full of fruit-trees, and flowers, and sweet herbs, now grown wild; and near the shore it is covered with radishes and sea-side oats. After dinner I walked to the valley called Lord Anson's park; and on our way found numbers of European shrubs and herbs,

'Where once the garden smiled,
And still where many a garden-flower grows wild:'

and in the half-ruined hedges, which denote the boundaries of former fields, we found apple, pear, and quince-trees, with cherries almost ripe. The ascent is steep and rapid from the beach, even in the valleys, and the long grass was dry and slippery, so that it rendered the walk rather fatiguing, and we were glad to sit down under a large quince-tree on a carpet of balm, bordered with roses, now neglected, and rest, and feast our eyes with the lovely view before us. Lord Anson has not exaggerated the beauty of the place, or the delights of the climate; we were rather early for its fruits; but even at this time we have gathered delicious figs, and cherries, and pears, that a few more days' sun would have perfected. I was quite sorry to leave our station in the park and return to the landing-place to embark for the dark close ship."—"The next morning," she remarks, "I had reached a lonely spot, where no trace of man could be seen, and where I seemed to have no communication with any living being. I had been some hours alone in this magnificent wilderness; and though at first I might begin with exultation to cry,

"I am monarch of all I survey,
My right there is none to dispute,"

yet I very soon felt that utter loneliness is as disagreeable as unnatural; and Cowper's exquisite lines again served me—

"Oh, solitude! where are the charms
That sages have seen in thy face?
Better dwell in the midst of alarms,
Than reign in this horrible place."

And I repeated over and over the whole of the poem, till I saw two of my companions of the morning coming down the hill, when I hurried to meet them, as if I had been really "out of humanity's reach."—Ed.

of the soil and the absence of springs of fresh water. The only spring I saw was flowing from a crevice of one of the craters: some of the trees attain a considerable size in the valleys, but they are not numerous, and with little variety of species. The birds, however, are abundant, and some of them exceedingly handsome, but so ignorant were they of man's devices, that they suffered themselves to be killed with a stick, so that a gun was only needed when they sat high on the top of a tree or rock. Many of the smaller kinds perched on my hat, and even unconsciously settled upon the gun (that instrument of their destruction) which I carried on my shoulder. During my visits to the island, of two hours a-day for three days, I killed forty-five individuals of nineteen genera, all of which I skinned carefully, and had then the mortification of losing all but one, a species of *Sula*, from the constant rain that prevailed for twelve days after leaving the Gallipagos. Among them were two kinds of *Pelican*, four of *Sula*, and four *Hawks* (one of the latter was particularly fine, of nearly an orange-colour), and a very small *Pigeon*. A species of rock cod was so abundant near the shore as to be taken without any bait, and the sharks were so voracious as to bite continually at the oars, as their points were raised from the water. The woods teemed with land tortoises, some weighing 400 lbs., and the shores with turtle. With my collection of plants I was almost as unfortunate as that of birds —out of the one hundred and seventy-five species which I gathered, I could save but fifty, and these in a very miserable state, as I had no place below in the vessel where I might stow them, nor could I pack them damp, and the rain ruined every thing that was exposed upon the deck. There was nothing, however, which I regretted so much as the destruction of a specimen of a new *Lacerta*, from twenty to thirty inches long, of a dark orange-colour, and with a rough warty skin. We had made good soup of these creatures when upon the island. Never did I experience greater mortification than from the loss of these collections, the Gallipagos have been so little visited by scientific persons, that every thing becomes of interest which is brought from thence, and I have now little or nothing to show that I have been there! I have, however, secured seeds, in a good state, of a very singular species of *Cactus*, which grows in the valleys, the trunk is two or three feet in diameter, and from forty to fifty feet high; it belongs to the section *Opuntia*, and has large bright yellow flowers, and very long flexible spines. Also of a fine *Gossypium* or Cotton-plant, which is a shrub four to ten feet high, with yellow blossoms and yellow cotton; and of a plant which will probably be found to belong to the *Coniferæ*. The thermometer stood frequently at 96°, and the heat was most oppressive; on one occasion, when the rain ceased for an hour, and the sun broke forth, it raised such a steam from the ground as proved almost suffocating.

After leaving James's Island, we passed along the East side of Albemarle Island, so near as to ascertain that it was inhabited, from seeing lights upon it after dark: some blue lights which were sent off from our ship were also answered, but instead of being able to land, we were suddenly driven off the shore by a tremendous thunder-storm. Never did I witness any thing equal in grandeur and singularity to the vividness and curious forms of the flashes of lightning: four tons of water were obtained from the sails and deck, which proved a most acceptable relief to us, increasing our allowance, and enabling us to wash our clothes. The remainder of our voyage within the Tropics was attended with variable winds, frequent rain, and almost nightly storms of thunder and lightning. In lat. 34° N., I caught an undescribed species o. Albatross, akin to *Diomedea fuliginosa*, but a smaller and less powerful bird. The *D. exulans*, as found in the higher latitudes of the Pacific, is much smaller than it is in the Southern Hemisphere, and will probably prove a distinct species. Our second mate, who kindly assisted me in taking these birds (and, as I mentioned before, they can only be captured in the most

stormy weather), fell upon the wet deck, being driven down by the violence of the gale, and fractured his thigh so severely as to suffer most dreadful torture for several succeeding weeks.

On the 12th of February we were in the latitude of the Columbia River, long. 136° W., but the weather was so boisterous, with such a tremendously heavy sea running, that we were obliged to lay to, day after day, endeavouring repeatedly to enter, for six weeks, up to the 1st of April, and suffered more storms than we had done during the whole of our previous voyage of eight months. On the 3rd of April we saw Cape Disappointment twenty-eight miles a-head, and were approaching it with a fair breeze, when a strong westerly wind again drove us out to sea; a second attempt was made three days after, when we got within four miles, but with no better success. In short, we could declare the hurricanes of North-West America to be a thousand times worse than those of the noted Cape Horn. In this latitude there is abundance of a small species of *Physalis*, of a transparent azure hue, which were frequently washed on the main-yard by the spray breaking over the vessel.

At last, on the morning of the 7th, a favourable wind rising, we were within forty miles of the entrance to the harbour, and joy and expectation sate on every countenance, all hands endeavouring to make themselves useful in accomplishing this wished-for object. Dr. Scouler and I kept the soundings, and safely passing over the sand-bar, where many vessels have been injured, and others lost, we happily gained the much-desired harbour, and anchored in Baker's Bay, on the North side of the Columbia, at four o'clock in the afternoon. Several cannon-shots were immediately fired to announce our arrival to the establishment seven miles up the river, but they were not answered. Thus terminated my long and tedious voyage of eight months and fourteen days. The joy of viewing land, and the hope of being able, in a few days, to range through this long-desired spot, and to resume my wonted pursuits and enjoyments, may be easily imagined. We spent the evening in great mirth, and went to rest early at night, happy to be able to sleep without the noise and motion and other disagreeable attendants of a long sea-voyage. I think I may truly reckon this as among the happiest moments of my life.

The following day, April 8th, was so rainy and cold that we could not leave the ship, but the next morning Dr. Scouler and I went ashore on Cape Disappointment. On stepping out of the boat, we picked up *Rubus spectabilis* (*B. Reg. t.* 1444.) and *Gaultheria Shallon*, with several other plants which had only been known to us in the Herbaria, or by name. Many species of *Vaccinium*, not however yet in flower, with *Tiarella* and *Heuchera*, both in full blossom, grew in the woods. In a few hours we returned to the ship, amply gratified. We found that during our absence a canoe with one Canadian and several Indians had been sent from the fort, bringing fresh provisions, potatoes, and butter. The latter also offered game, dried salmon, and fresh sturgeon, with dried roots and preserved berries of several kinds, for barter, and as they put many questions to us, by the aid of a little English and many signs, we viewed them with much curiosity and interest. The natives showed themselves sufficiently shrewd in bargaining for the trinkets, molasses, and bread which we gave them in exchange for their provisions. The practice of compressing the forehead, of perforating the septum of the nose and ears, and inserting shells, bits of copper, beads, or in fact any kind of hardware, gives a stranger a curious idea of the singular habits of these people.

On Monday the 11th, the ship went up the river, and anchored on the side opposite the establishment, at Point Ellis, and the following day we were received by Mr. M'Kenzie, the person then in charge, who informed us they were about to abandon the present place for a more commodious situation, ninety miles up the river, on the North side. Also, that the Chief Factor,

John M'Loughlin, Esq., was there, but would be down as soon as he received intelligence of the ship's arrival. From Mr. M'Kenzie we experienced great attention, and though we did not quit the vessel till the 19th, I was daily on shore. With respect to the appearance of the country, my expectations were fully realized, in its fertility and variety of aspect and of soil. The greater part, as far as the eye could reach, was covered with *Pines* of various species. The Atlantic side of this great Continent much exceeds the western coast in the variety of its kinds of forest-trees; there are no *Beeches*, *Magnolias*, *Gleditschias*, or *Juglans*, and only one kind of *Oak* and of *Ash* on the Pacific side.

Cape Disappointment, on the southern bank of the river at the ocean, is a remarkable promontory of rock, forming a good sea-mark, elevated about seven hundred feet above the level of the sea, and covered with *Pines* and brushwood. The country to the northward, near the ocean, is hilly. The opposite point, called Point Round, or Point Adams of Lewis and Clarke, is low, and in many places swampy: a ridge of low hills runs for about forty miles southward, skirting the sea, as far as Cape Lookout, so named by Vancouver. The breadth of the Columbia is about five miles at its mouth, not including Baker's Bay, which has a deep bend; the current is very rapid, and produces great agitation when the wind blows from the westward, dashing the water over the sand-bar quite across the river, so that no channel can be perceived, and it becomes impossible for a vessel to go out or in with safety.

My paper for preserving plants being all in the hold of the ship, I could do but little in collecting, though we continued our excursions every day, when the weather permitted, and were frequently meeting with objects which caused us much gratification. Nothing gave me, I think, greater pleasure, than to find *Hookeria lucens* in abundance in the damp shady forests, growing with a plant whose name also reminded me of another valued friend, the *Menziesia ferruginea*. All my paper and trunks were sent ashore on the 16th, and on the 19th, I embarked in a small boat with Mr. John M'Loughlin, the Chief Factor, who received me with demonstrations of the most kindly feeling, and showed me every civility which it was in his power to bestow.

The following night, at ten p. m., we arrived at Fort Vancouver, ninety miles from the sea, the spot where the Officers of Capt. Vancouver completed their survey of the river in 1792. The scenery round this place is sublimely grand—lofty, well wooded hills,—mountains covered with perpetual snow,—extensive natural meadows, and plains of deep, fertile, alluvial deposit, covered with a rich sward of grass, and a profusion of flowering plants. The most remarkable mountains are Mounts Hood and Jefferson, of Vancouver, which are at all seasons covered with snow as low down as the summit of the hills by which they are surrounded. From this period to the 10th of May, my labour in the neighbourhood of this place was well rewarded by *Ribes sanguineum*, (*Bot. Reg. t.* 1349. *Bot. Mag. t.* 3335.), a lovely shrub, which grows abundantly on the rocky shores of the Columbia and its tributary streams, producing a great profusion of flowers, and but little fruit, except in the shady woods where the blossoms are comparatively few; I also found *Berberis Aquifolium*, (*Bot. Reg. t.* 1425.) *B. glumacea*, (*Ejusd. t.* 1426. De Cand. *B. nervosa* of Pursh), *Acer macrophyllum*, (*Hook. Fl. Bor. Am. v.* 1. *t.* 38.) and *Scilla esculenta*, (*Bot. Mag. t.* 2774.) the *Quamash* of the natives, who prepare its roots in the following manner. A round hole is scraped in the ground, in which are placed a number of stones, and a fire is kept burning on them till they are red hot, when it is removed and replaced by some brushwood and straw, on which the roots are laid, (covered with leaves, moss, or straw, with a layer of earth,) and they remain there until they are baked or roasted, a process which occupies a few hours, after which they are taken out and hung up to dry. Sometimes the natives bruise these roots, or pound them into cakes and round lumps, which they lay up on the shelves in their lodges for winter use.

When cooked, they have a sweetish and by no means unpleasant taste, and a very palatable beverage might probably be prepared from them. Lewis and Clarke observe that they are apt to produce bowel complaint, if eaten in large quantities, as they certainly do flatulence. The plant abounds in all low alluvial plains, on the margins of woods, and banks of rivers. *Pyrola aphylla*, (*Hook. Fl. Bor. Am. t.* 137.) *Caprifolium occidentale*, (*B. Reg. t.* 1457.) and a multitude of other plants, delighted me highly; nor can I pass over the beauty, I might say the grandeur, of *Lupinus polyphyllus*, (*Bot. Reg. t.* 1096, *and var. albiflorus, t.* 1377.) covering immense tracts of low land on the banks of streams, with here and there a white-flowered variety, and growing to a height of six or eight feet, wherever the ground was partially overflowed. The *Gaultheria Shallon*, (*Bot. Mag. t.* 2843, *Bot. Reg. t.* 1372), is called by the natives *Salal* and not *Shallon*, as stated by Pursh, whose figure and description are, however, good; it grows abundantly in the cool pine forests, most luxuriantly in the shady places near the ocean. I have seen it as far as forty miles above the Grand Rapids of the Columbia River, but it is not so vigorous as when found nearer the sea. The fruit is abundant and very good, so that I hope it will ere long find a place in the fruit garden, as well as the ornamental border. I also gathered, among other curious plants, a noble species of *Arbutus*, *A. procera* (*Bot. Reg. t.* 1753). We had abundance of excellent salmon, brought to us by the native tribes, which they sold very cheap. I returned to Fort Vancouver at the end of the month, having increased my collection of plants by seventy-five species, and also killed four quadrupeds and a few birds.

Till the 20th of June, I employed myself in the vicinity of Fort Vancouver in procuring seeds of early flowering plants, and collecting various objects of Natural History, when I availed myself of the departure of the boats for the inland establishments, to accompany them as far as seemed advisable. Starting from the mouth of the river at eight o'clock in the morning, in a small boat with one Canadian and five Indians, we proceeded about forty miles that day. The current was strong, owing to the melting of the snow on the mountains, and when we came to open parts of the banks, unobstructed by timber or rocks, I botanized as we went along. We supped on roasted sturgeon and bread, with a basin of tea, and slept in the boat which we dragged on shore. The next day we passed the Grand Rapids, forty-six miles above the Fort; the scenery at this place is wild and romantic, with high mountains on each side, clothed with timber of immense size. The Rapid is formed by the river passing through a narrow channel, one hundred and seventy yards wide: the channel is rocky, obstructed by large stones, and small islands, with a fall of one hundred and forty-seven feet, the whole Rapid being about two miles long. In many places the banks rise perpendicular, to a height of several hundred feet, over which are some fine waterfalls; the rocks are chiefly secondary, sandstone, limestone, and blue granite. Whole petrified trees are visible close to the water's edge, both of *Pine* and *Acer macrophyllum*.

This being the season of salmon fishing, I had opportunities of seeing prodigious numbers taken simply with a small hoop or a scoop-net, fastened to the end of a pole. The fish are of excellent quality and average about fifteen pounds in weight. In the still parts of the water, immense quantities are caught in these nets, to which are attached spindles formed of the wood of *Thuja plicata*, which is very buoyant and which serve as corks, while small oblong stones answer the purpose of lead. The rope of the net is made from a species of *Salix*, or from the *Thuja*, and the cord of *Apocynum piscatorium* (*A. hypericifolium ?*) a gigantic species peculiar to this country, whose fibre affords a great quantity of Flax.

The country continues mountainous as far as the lower branch of the Multnomak River, the Belle Vue Point of Vancouver, about seventy miles from the ocean, where the banks again become low, and the back ground rises gradually. On the South towards the head water of the Multno-

mak, we saw a ridge of snowy mountains, and one which was very conspicuous, and of a conical form in the distance, far exceeding the other in height. This I have no doubt is Mount Jefferson, of Lewis and Clarke. Another was equally striking due East, and one due North: the former, Mount Hood, and the latter Mount Saint Helens, of Vancouver; their height must be very great, at least ten thousand or twelve thousand feet, and I am informed that two-thirds are continually wrapped in snow, of which there is hardly any sensible diminution even in summer, immense barriers of ice rendering every attempt to reach the summits quite impracticable. From the Grand Rapid to the Great Falls, seventy miles, the banks are steep, rocky, and in many places rugged; and the hills gradually diminish in elevation, and are thinly covered with stunted timber and shrubs but a few feet high. Here we were no longer fanned by the huge *Pine*, the *Thuja* and *Acer*, nor gratified by observing the perpetual quiver of the beautiful *Populus tremuloides*. Far as the eye can reach, there is but a dreary waste of barren soil, thinly covered with scanty herbage. Here however I found the beautiful *Clarckia pulchella*, (*Bot. Mag. t.* 2918.), *Calochortus macrocarpus*, (*Bot. Reg. t.* 1152.), *Lupinus aridus*, (*Bot. Reg. t.* 1242.), and *leucophyllus*, (*Bot. Reg. t.* 1124.), *Brodiæa grandiflora*, (*Bot. Mag. t.* 2877. *Bot. Reg. t.* 1183.) *&c.* The present bed of the river at the Falls, is six hundred feet lower than the former one, and of decomposed granite. I could not at this season, go higher than a few miles above the Falls, but was amply repaid by *Purshia tridentata*,[1] (*Hook. Fl. Bor. Am. v.* 1. *t.* 58.) *Bartonia albicaulis*, (*Bot. Reg. t.* 1446.), *Collomia grandiflora*, (*Bot. Mag. t.* 2894. *Bot. Reg.* 1174.), and several *Pentstemons*,[2] and seeds of many desirable plants, many of which I secured during this expedition.

Early in the morning of the 19th July, I descended the river in an Indian canoe for the purpose of prosecuting my researches on the coast, a design which was in a great measure frustrated, by the tribe among whom I lived going to war with the nations residing to the northward, in that very direction which I intended to follow. During my stay several persons were killed and some wounded in a quarrel. The principal chief in the village, Cockqua, treated me with the utmost fidelity, and even built me a small cabin in his own lodge, but the immense number of fleas occasioned me to remove to within a few yards of the river: still my friend was so much interested in my safety that he watched himself a whole night, at the time when he expected the war party. In the morning about three hundred men in their war garments, danced the war dance, and sang several death songs, which caused in me certainly a most uncomfortable sensation, and the following morning brought us seventeen canoes, carrying nearly four hundred men, when after several harangues, it was mutually agreed to suspend hostilities for the present.

A sturgeon was caught by one of my companions, which measured twelve feet nine inches from the snout to the tip of the tail, and seven feet round the thickest part, and its weight exceeded five hundred pounds. Among the plants which I found on this occasion were, *Lupinus littoralis*, (*Bot. Mag. t.* 2952.) *Carex Menziesii*, *Juncus Menziesii* and *globosus*, *Vaccinium ovatum*, *parvifolium*, (*Hook. Fl. Bor. Am. v.* 1. *t.* 128.), and *ovalifolium*, (*Hook. Fl. Bor. Am. v.* 1. *t.* 127.). I also obtained seeds of the beautiful *Spiræa ariæfolia*, (*Bot. Reg. t.* 1367.) of *Gualtheria Shallon*, *Ribes sanguineum*, *Berberis* and other valuable and interesting plants.

Before taking leave of my Indian friends, I purchased several articles of wearing apparel, things used in their domestic economy, &c, for which I paid in trinkets and tobacco. I arrived at Fort Vancouver again on the 5th of August, and employed myself until the 18th in drying the specimens I had collected, and making short journeys in quest of seeds and other plants: my

[1] To this genus the *Cercocarpus* of Humboldt and Kunth is very nearly allied, of which a species was afterwards found by Mr. Douglas, in California. Ed.

[2] See Bot. Register and Bot. Magazine for several of this beautiful genus introduced by Mr. Douglas. Ed.

labours being materially retarded by the rainy weather. As there were no houses yet built on this new station, I first occupied a tent which was kindly offered me, and then removed to a lodge of deer-skin, which soon however became too small for me in consequence of the augmentation of my collections, and where also I found some difficulty in drying my plants and seeds. A hut constructed of the bark of *Thuja occidentalis* was my next habitation, and there I shall probably take up my winter quarters. I have only been in a house three nights since my arrival in North-West America, and these were the first after my debarkation. On my journeys I occupy a tent wherever it is practicable to carry one; which however is not often, so that a canoe turned upside down, is my occasional shelter; but more frequently I lie under the boughs of a Pine Tree, without any thing further. In England, people shiver at the idea of sleeping with a window open; here each person takes his blanket and stretches himself, with all possible complacency, on the sand, or under a bush, as may happen, just as if he were going to bed. I must confess that although I always stood this bivouacking remarkably well, and experienced no bad effects from it, I at first regarded it with a sort of dread, but now habit has rendered the practice so comfortable to me, that I look upon any thing more as mere superfluity.

But to return from this digression; I again set off on the 19th, for the purpose of ascending the river Multnomak, one of the southern tributaries of the Columbia. This is a very fine stream, with remarkably fertile banks; thirty-six miles above its junction with the Columbia, are Falls of forty-three feet perpendicular height, over which the whole breadth of the river is precipitated, forming one unbroken sheet at this season of the year, but in spring and autumn divided into three channels. There is but little current thus far, as the stream is gorged back by the waters of the Columbia. The portage over the Falls is no small undertaking. I killed several of the *Cervus leucurus*, or Long White-tailed Deer, as well as some of the Black-tailed kind, *C. macrotis*. Two days farther took me to the village of the Calapoori Indians, a peaceful well disposed people, twenty-four miles above the Falls, and where I formed my camp for several days. A hunting party started from hence, proceeding westerly over the ridge of mountains. Near my encampment was a saline spring, to which the deer frequently resorted, as well as a beautiful ringed species of *Columba*, whose elegant movements when picking up and licking the saline particles that were found round the edge, afforded me great amusement. In the extensive plains, bounded on the West by the mountainous woody part of the coast, and on the East, by high mountains, as also on the banks of the River Sandiam, one of the rapid branches of the Multnomak, grows abundance of the *Escholtzia Californica*, (*Bot. Reg. t.* 1168. *Bot. Mag. t.* 2887.), also *Iris tenax*, *Bot. Reg. t.* 1218, *Bot. Mag. t.* 3343.), *Nicotiana multivalvis* (*Bot. Reg. t.* 1067.), two new species of *Trichostemma*, and many other delightful plants. I procured some curious kinds of *Myoxus*, *Mus*, *Arctomys*, a new species of *Canis*, of singular habits, and a genus of animals which had been hitherto undescribed (probably *Geomys Douglasii* of Richardson's *Fauna Boreali-Americana*). In the tobacco pouches of the natives, I found the seeds of a remarkably large Pine, which they eat as nuts, and from whom I learned that it grows on the mountains to the South; no time was lost in ascertaining the existence of this truly grand tree, which I named *Pinus Lambertiana;* but no perfect seeds could I find, and I returned to my rendezvous at Fort Vancouver, richly fraught with the treasures I had collected.

A few days were devoted to arranging my last collection, and drying the seeds I had gathered, when, without loss of time, on the 5th of Sept., having engaged a chief as my guide, and accompanied by one Canadian, I started on a journey to the Grand Rapids. Two days were consumed in ascending the Columbia, though I was favoured with a fair wind; I pitched my camp close to Chumtalia's (my guide) house, taking the precaution of having the ground well drenched with wa-

ter, to prevent the annoyance of fleas, from which, however, I did not wholly escape. On the Saturday morning, as soon as Chumtalia learned that it was my intention to visit the summit of the mountains on the North side of the river, he forthwith fell sick, and presently framed an excuse for not accompanying me on the expedition. He however sent a younger brother to guide me, together with two young men from the village, and I left the Canadian at the tent, to take care of my books, &c., charging Chumtalia to supply him well with salmon, and to see that no harm should befall him. To encourage my guides, I was under the necessity of giving them the whole of the provision the first day, except four small biscuits and a little tea and sugar; at our first encampment, about two-thirds up the mountain, we left our blankets, intending, after having reached the summit, to return thither and sleep. But our path being dreadfully fatiguing, climbing over the shelving detached rocks and fallen timber, the night overtook us ere we had reached the top. I killed a young half-grown eagle, on which we fared, and with a little tea, made in an open kettle, and drunk out of vessels formed of bark, we passed a tolerable night, without any bedding. Previous to lying down, I used the precaution of drying all my clothes, which were drenched with perspiration from the violent exercise I had taken. The following day in the dusk of evening, I regained my camp, faint and weak, but much pleased to find that all had gone on well during my absence. My feet suffered so severely from this three days' journey, that I was totally unable to prosecute my fatiguing researches without taking some rest, and I therefore amused myself with fishing and shooting seals, (*Phoca vitellina*) which were sporting in vast numbers in the Rapid where the salmon are particularly abundant. Two days after I succeeded in persuading Chumtalia to attend me to the mountains on the South side of the river, which he willingly did. The ascent was easier than the former one, and I reached the top after a laborious walk of fifteen hours, having had the good fortune to find two new species of *Pine*, *Pinus nobilis* and *P. amabilis*, the grandest trees of the tribe, *Helonias tenax*, with a new *Rhododendron* and a second *Pterispora* (?) also some interesting individuals of the genus *Ribes*, rewarded my labour; on the rocky parts of the mountain, *Arbutus tomentosa*, (*Bot. Mag. t.* 3320. *Bot. Reg. t.* 1791.) was not rare, and I procured seeds of several species of *Pentstemon*. On the morning of the 13th I re-embarked in my canoe and soon after mid-day reached Fort Vancouver, so different is the length of time occupied in ascending and descending the river. There I had the pleasure to find Dr. Scouler returned from his northern voyage, and so delighted was I to hear of his success, and he to be informed of my movements, that we sat and talked over our respective journies, till the sun, rising broad over the noble stream, apprized us that a new day had began, and sent us off to seek a few hours repose. The rest of this month was devoted to packing my collections, consisting of sixteen large bundles of dried plants from America, and eight gathered in other places, a large chest of seeds, one of birds and quadrupeds, and another containing various articles of dress, &c. A portion of each kind of the seeds was reserved in order to be sent across the continent in the ensuing spring.

An originally slight wound which I had received, now becoming troublesome, compelled me to desist from my labours for some weeks, by which I lost a valuable portion of time, at an important season of the year: from the 22nd of October to the 15th of November, was thus passed.

In consequence of receiving this wound on my left knee, by falling on a rusty nail, when employed in packing the last of my boxes, I was unfortunately prevented from carrying my collections to the ship myself, and accordingly wrote a note to Captain Hanwell, requesting he would have the goodness to place them in an airy situation, particularly the seeds, and that, if possible, their place of deposit should be above the level of the water. To this note I received a very kind answer, assuring me that my directions should be attended to. On the

7th my leg became violently inflamed, and a large abscess formed on the knee-joint, which did not suppurate until the 16th. This unfortunate circumstance, occurring at the period when I wanted to be employed in gathering seeds, gave me much uneasiness; but learning, on the 22nd of October, that the ship had been detained by contrary winds, and finding myself better, and being also very desirous of losing as little time as possible at this important season, I left Fort Vancouver in a small canoe, with four Indians, for the purpose of visiting my old shipmates, on my way to Whitby's Harbour of Vancouver, or the mouth of the Cheeheelie River, in lat. 48° N., near which place grow some plants of which I had previously obtained but imperfect or no specimens, or of which I wished to collect the seeds. Among them was *Helonias tenax*, a very desirable plant for cultivation. I camped at the junction of the Multnomak River with the Columbia, after having made a distance of twenty miles, when a strong westerly wind setting in from the sea obliged me to have my canoe examined, and new-gummed before starting again; I had not proceeded many miles when it struck against the stump of a tree, which split it from one end to the other, and compelled me to paddle hastily to shore with the water rushing in upon me. During the time the Indians were employed in repairing the damage, I turned cook, made a basin of tea for myself and cooked some salmon for my companions, after which we proceeded on our route. About eight o'clock the same evening we put ashore at the village of Oak-point, to procure some food, when an Indian handed me a letter from Dr. Scouler, the surgeon of the ship, in which my friend informed me that they would not probably leave the bay for some days, and as the vessel had been seen there that morning, I was desirous of writing to Mr. Sabine at the latest possible date. After obtaining a few dried salmon, and a wild goose, we proceeded four miles further down the river till midnight, when we stopped to take a little supper, hoping before day-break the next morning to reach the sea, from whence we were still about forty-five miles distant. At four o'clock in the morning a strong breeze set in from the sea, which produced a very angry swell on the river, and obliged me to coast along its shore (a measure indeed almost necessary under any state of wind, because my canoe was in so frail a condition) and afterwards to haul our bark across a narrow neck of land at Tongue Point, when unfortunately a sudden change of wind enabling the ship in the bay to weigh her anchor we missed her by just one single hour! This was a severe disappointment, as besides not seeing Dr. Scouler, I had my letter written all ready to hand on board.

Leaving my canoe men to lie down and sleep, I took my gun and knapsack, and proceeded along the bay in search of seeds. At dark I returned to the lodge of *Madsue*, or "*Thunder*," one of the Chenook chiefs, where I found his brother, *Tha-a-mux*, a chief from the Cheeheelie River, on Whitby's Harbour, and as he was then going home I acceded to his request to accompany me. The following morning Com-Comly, the chief of all the Chenooks on the North side of the river, sent his canoe with twelve Indians to ferry us across the Columbia to Baker's Bay, on the South side, which they performed with great skill, though a violent storm overtook us in the middle of the channel, by which we lost a few pounds of flour and a little tea, all the provision we had except some ounces of chocolate, which I carried in my pocket. This canoe was so much larger and more commodious than my own, that I had succeeded in bargaining for the loan of it, and I attribute our preservation to the strength of the boat and dexterity of the Indians; by which, though the sea repeatedly broke over us, we reached the shore in perfect safety, and encamped at sunset near Knight's River, in Baker's Bay. In the evening I gave the two chiefs a dram of well-watered rum, which pernicious liquor they will, generally speaking, make any sacrifice to obtain. I found, however, an exception in my new guide;

on my enquiring the reason of his temperance, he informed me that some years ago he used to get drunk, and become very quarrelsome; so much so, that the young men of the village had to take and bind him hand and foot, which he looks upon as a great disgrace, and will taste spirits no more. In lieu of drinking, however, I found him an expensive companion, from his addiction to tobacco. So greedily would he seize the pipe and inhale every particle of smoke, that regularly five or six times a day he would fall down in a state of stupefaction. In self-defence I was obliged to smoke, when I found that my mode of using the Indian weed diverted my companion as much as his had me: "Oh," cried he, "why do you throw away the food? (smoke). See, I take it in my belly."

The following day, during the whole of which the rain fell in torrents, we made a small portage of four miles over Cape Disappointment, the North point of the Columbia, to a small rivulet that falls into the ocean, twelve miles to the northward. I found the labour of dragging my canoe occasionally over the rocks, stumps, and gulleys that intercepted our way extremely trying, especially as my knee became more and more stiff and troublesome from the damp and cold. On reaching the bay, I proceeded along it for a few miles, when the thick fog obliged us to encamp under a shelving rock, overshadowed with large Pines, a little above tide-mark. After a comfortless night I resumed my journey at day-light, and, having been disappointed of procuring any salmon at the village which we passed, because it was abandoned, we pushed on with as much speed as possible to Cape Foulweather, which we gained, after proceeding forty miles along the coast. The rain continuing to fall heavily the next day, we sent the canoe back to the Columbia from this place, it being also impossible, with so few hands, to carry it over a portage of sixteen miles. The Indians, too, were solicitous to leave me, when they knew that all the provisions were exhausted. The wind increased about midnight, two or three hours after they had departed, to a perfect hurricane, accompanied with sleet and hail, which obliged us twice to shift our camp, as the sea rose unusually high and almost reached us, and which also rendered me very anxious about the safety of the Indians, who, as I afterwards learned, were so fortunate as to gain the shelter of a creek until the storm abated. We had no protection, save what was afforded by our wet blankets and a few pine branches, and were destitute of provision. A few berries of *Arbutus Uva-Ursi* were all that could be got at this place, and the high wind and heavy rain almost rendered it impossible to keep up any fire. All the wild fowl had fled to the more sheltered spots, not a bird of any kind could be seen. Long ere day-light we were ready to leave Cape Foulweather;[1] well convinced that it deserved its name, and as there appeared no likelihood of procuring food, we walked along the sandy beach to endeavour to reach Whitby Harbour, where my guide expected to meet a fishing party. On arriving there, when we found the village deserted, I can hardly describe the state I was in. While my guide and the Indians were collecting some drift wood, I made a small booth of Pine branches, straw and old mats. My blanket having been drenched all day, and the heavy rain affording no opportunity of drying it, I deemed it imprudent to lie down to sleep, and accordingly spent the night sitting over the fire. The following day found me so broken down with fatigue and starvation, and my knee so much worse, that I could not stir out. We fared most scantily on the roots of *Sagittaria sagittifolia* and *Lupinus littoralis*, called in the Chenook language *Somuchtan*, till, crawling out a few steps with my gun, I providentially saw some wild birds, and killed five ducks at one shot. These were soon cooked, though one of the Indians ate his share raw. To save time in plucking the fowl, I singed off the feathers, and, with

[1] On the Map, belonging to the *Flòra Boreali-Americana*, and drawn up under Mr. Douglas' inspection,—probably by error, Cape Foulweather is represented as on the South side of the Columbia, and Whitby Harbour on the North.

a basin of tea, made a good supper on one of them. I had certainly been very hungry, yet, strange to say, as soon as I saw the birds fall, my appetite fled, and I could hardly persuade myself I had been in such want.

Our fire having attracted the attention of my guide's friends living on the other side the bay, who were looking out for him, they sent a canoe. Arriving at midnight I was asleep, and did not know of the fortunate circumstance till he woke me in the morning, for he had not allowed them to make any noise to disturb me, since I had taken little or no rest during three preceding nights. As we were crossing the bay together I killed two gulls, one large and white, with a bluish hue on the wings, which were tipped with black, the other of equal size, but all mottled with grey;—also a species of *Colymbus;* but I had no opportunity of preserving them. I reached my guide's house at dusk, and remained there several days, partaking of whatever they could spare, and treated with all the kindness and hospitality which Indian courtesy could suggest. During this time I procured a little seed of *Helonias tenax*, though not so much as I could wish, owing to the lateness of the season, with abundance of the seeds of a splendid *Carex*, and a *Lupine* (*L. littoralis.*) The roots of the latter plant are collected by the natives, and roasted on the embers, and they are the *Liquorice* alluded to by Lewis and Clark; they contain much farinaceous substance, and are a very nutritive food; as mentioned above, the natives call them *Somuchtan.*

On the 7th of November I proceeded up the river Cheeheelie, with my guide, in a canoe, stopping at such places as presented any thing new. On the 11th I had attained a distance of sixty miles from the ocean, when, discouraged by the deluges of rain which fell, and finding that my canoe was too large to proceed farther, owing to the cascades and occasional shallowness of the water, I discontinued my voyage, which was intended to extend to the source of the river, and dismissed my guide, after making him such presents as I deemed were well deserved by the zeal and kindness I had experienced at his hands. Before leaving me, however, this man, called "the Beard," by his tribe, entreated me to shave him, as he makes some pretensions to civilization, and imitates English manners with considerable nicety. I complied with his request, and invited him to come and see me at the New Year, at the Fort, when I would give him a smoke and a dram, and shave him again. He asked me farther,—"to let all King George's chiefs know about him when I spoke to them on paper." This river is a large stream nearly as wide as the Thames, very rapid, interrupted in many parts with cascades, and having steep and rocky banks covered with woods, like those found on the Columbia.

At the village where I stopped, I bargained with an Indian to carry my luggage on his horse to the Cowalidsk river, forty miles distant, a considerable stream, which empties itself into the Columbia. I had some difficulty in arranging with the fellow, and found him the most mercenary rascal I ever yet met. Having no alternative, I had to give him twenty shot of ammunition, two feet of tobacco, a few flints, and a little vermilion.

This distance, though not more than forty miles, took two days; the low places in the plain were so many lakes, the rivulets had overflowed their banks, and the difficulty of ascending and descending the numerous woody hills was greatly encreased by these causes. It rained both days; we had consumed all the berries I had collected, and Mr. Mackenzie, who accompanied me, suffered severely from eating the roots of a species of *Narthecium.* Fortunately we found at the Cowalidsk a small boat, which Schachanaway, the chief, had borrowed from the establishment a few days before and he also gave us some roots, dried salmon, and a goose (*Anas Canadensis*). The following day we descended the river to the Columbia, and on the 15th November landed at Fort Vancouver. Seeds of *Helonias tenax, Rubus spectabilis* (*Bot. Reg. t.* 1424.

were the only things I saved in this unfortunate journey.

My return up the Columbia was effected by means of my cloak and blanket, which I used as sails. It was midnight of the 15th when I reached Fort Vancouver, after an absence of twenty-five days; during which I experienced more fatigue, and gleaned less, than in any trip I ever made in this country.

From this period, the middle of November, to the end of December, my infirm state of health, and the prevalence of the rainy season entirely precluded any thought of Botany. At mid-day of the 18th, the annual express, consisting of two boats and forty men, arrived at Fort Vancouver, from Hudson's Bay, whence they had started on the 21st of July. At a distance of several miles we had descried them, rapidly descending the stream, and as in this remote country, it is only once a-year that the Post, if I may so call it, arrives from England, we eagerly hurried to welcome our guests, each congratulating himself on the prospect of receiving letters from home. I, for one, was heavily disappointed; to my great regret, the party informed me that there was no parcel, letter, nor article of any kind for me, and though this was accounted for by the circumstance, that they had quitted Hudson's Bay before the arrival of the ship which sailed for that port from England in the month of May, still it was tantalizing to reflect that whatever might have been sent to me by that vessel, must now lie on the other side of the great Continent of America until November of next year. Mr. M'Leod, the gentleman in charge of this expedition, informed me that he had met Capt. Franklin's party on Cumberland Lake, on their way to Bear Lake, their winter residence. I learned also that a Mr. Drummond, whom, from the description, I could not but hope was my old botanical acquaintance, the nurseryman at Forfar, was attached, as Naturalist, to the expedition, and that he had accompanied Mr. M'Leod so far as the Rocky Mountains, where he meant to spend the winter season near Peace River and Smoking River. Mr. M'Leod, whom I find to be a very agreeable person, informs me that he has passed the last five years on Mackenzie's River, of the country lying near which, he possesses more knowledge than any other person. The natives, whose language he speaks fluently, assure him that there is a river, running parallel with Mackenzie's River, to the West, and equalling it in size, which falls into the sea near Icy Cape. He had assembled the Indians with a view to making a journey in that direction, when orders arrived which obliged him to start for Hudson's Bay. In this gentleman may be seen what perseverance can effect, as he had visited the Polar Sea, and the Atlantic and Pacific Oceans in the short space of eleven months. The sea, to the westward of Mackenzie's River is said to be open after July, so that little difficulty or exertion would be found in going to Icy Cape by land.

During the brief intervals of good weather, I crawled out whenever my wounded leg enabled me to move, and taking my gun, collected some birds, or went to the woods in search of Mosses and other cryptogamic plants. Till the 15th of December there was hardly any frost, and the weather, when dry, was very pleasant, though the cold was considerable during night. But on the 24th of that month, the rain fell in such torrents that my little hut of *Thuja* bark became untenantable, the water standing fourteen inches deep on the floor; Mr. M'Loughlin kindly invited me to take up my quarters with him in his half-finished house, and thither I removed all my little articles on the morning of Christmas Day. After morning service was over, the gentlemen of the Fort took an airing on horseback, in which my troublesome knee, much to my vexation, prevented my joining.

January 1st, 1826. The commencement of a new year, in such a far-removed corner of the globe, where I am almost cut off from all civilized society, suggests many reflections. On New Year's Day, 1824, I was on the Atlantic, returning to my native land from North America; on

the same day, this time twelvemonth, I was scudding over the Pacific, between the Island of Juan Fernandez and the Gallipagos; and as to where I may be ere another year revolves, is known only to the all-wise Disposer of events.

ACCOUNT OF THE ZOOLOGY OF THE COLUMBIA.

So few events occurred between this date and the 1st of March, that my journal is not worth transcribing. I may, however, mention some birds of this country that came under my notice; and first, the *Silver-headed Eagle* (*Aquila leucocephala* of Richardson and Swainson?) a grand creature, abundant wherever there are rivers containing fish. These birds perch on dead trees and stumps overhanging the water, and are invariably found near cascades and falls; they are wary and difficult to be killed, although other species of Eagle do sometimes overcome them. The voice is a shrill whistle. They build their nests in large trees, not confining themselves to dead trunks, and appear always to select the most conspicuous situations, such as the tops of steep rocks, points and necks of land, where they may be almost certainly looked for. Two, three, and even four young ones are hatched at a time, which keep the nest, and continue on the tree much longer than most birds, seldom quitting the vicinity of the place where they were reared. The colour of the first plumage is a brownish-black, which in the first spring assumes a mottled grey, lightest on the head and tail: the second year, these parts become perfectly white, and the body black. I killed one of these birds flying, last July, during an excursion of twelve days, which I had made principally for the sake of obtaining roots or seeds of the *Cyperus* mentioned by Pursh in his Preface. The bird, a fine large male, was perched on a stump close to the village of Cockqua, one of the principal chiefs of the Chenook nation. This tribe was at war with the Clatsops and some other Indians, as mentioned before, and many were the feats of strength and dexterity which they performed, in order to show their superior powers, among which were hitting a mark with a bow and arrows, and a gun. One individual passed the arrows through a small hoop of grass, six inches in diameter, thrown up into the air by another person, and then with his rifle struck a mark one hundred and ten yards distant, exclaiming that none of King George's Chiefs could do the like, any more than chaunt the death-song, and dance war-dances with him. On this bravado, deeming it a good opportunity to show myself a fair marksman, the poor *Silver-headed Eagle* was made to pay for it. I lifted my gun, which was charged with swan-shot, walked to within forty-five yards of the bird, and throwing a stone to raise him, brought him down when flying. This had the desired effect; many of the natives, who never think of the possibility of shooting an object in motion, laid their hands on their mouths in token of fear, a common gesture with them. The fellow, however, still showing himself inclined to maintain his superiority, gave me a shot at his hat, which he threw up himself, when my shot carried away all the crown, leaving nothing but the brim. My fame was hereupon sounded through the whole country, and a high value attached to my gun. Ever since, I have found it of the utmost importance to bring down a bird flying when I go near any of their lodges, at the same time taking care to make it appear as a little matter, not done on purpose to be observed. With regard to the hat in question, I may mention that it was woven of the roots of *Helonias tenax*, which the Indians of the Columbia call *Quip-Quip*, and on my observing the tissue with attention, Cockqua promised that his little girl, twelve years of age, should make me three or four after the European shape, giving me at the same time his own hat, and a large collection of baskets, cups, and pouches of the same material, for which I paid in tobacco, knives, nails, and gun-flints. The roots of *Cyperus* and *Thuja* are also used for the same purpose. Cockqua kept his promise, and three months after brought me the hats, one of which had initials woven in with a

dark-stained *Fucus*. I gave him for these and for ten pieces of wood, made of *Spiræa capitata*, each tipped with a beaver's tooth, and used in playing one of their games,—one blanket, value 7s., and some beads, rings, and needles, as a present to the little girl who wrought the hats. When returning last summer from the Grand Rapids, I saw one of these *Silver-headed Eagles* take a small sturgeon out of the water, and as he was soaring over my head, I lifted my gun and brought him down. The claws of the bird were so firmly clenched through the cartilaginous substance of the fish's back, that he would not let go, till I introduced a needle into the vertebræ of his neck. The sturgeon measured fifteen inches long, and weighed four pounds.

The *Large Brown Eagle* is less plentiful than most species of its tribe, and not so shy. It is also less ferocious than the *Silver-headed Eagle*, of which it stands in great fear. I was able to kill but one, and an examination of its stomach, which was full of small birds, seemed to show that it does not live on fish.

The *Small Eagle* appears to be rare, as I never saw more than one pair, of which I killed one. Its flight is very quick, and though far inferior in size and strength to the other Eagles of this country, it boldly pursues them all. I cannot say what is the nature of its food. The legs and feet are of a light and bright blue.

The hunters inform me that the *Calumet Eagle* (*Aquila Chrysætos*, Richardson and Swainson) is found two degrees south of the Columbia, in the winter season, and I saw two specimens which had been killed there.

A species of *Buzzard* or *Vulture* (*Sarcoramphos Californianus* of Vigors), is the largest bird seen here, except the Wild Swan. I killed only one of these interesting birds, but the buck-shot which went through its head, spoiled the specimen for preservation, which I exceedingly regret, as I am sure the species is yet undescribed. I have since fired at many of them with every kind of smaller shot, but without effect. Seldom more than one or two of these Buzzards are seen together; but when they can find the carcase of any dead animal, they gorge so gluttonously, that it is easy to knock them down with a stick. I shall shortly try to take them with a baited steel trap. The colour of this species is similar to the small Canadian Buzzard which I sent home, the beak and legs bright yellow. Its wing-feathers are highly prized by the Canadian Voyageurs for making the stems of their tobacco-pipes.

Of the *Hawk* tribe I have seen but four species, and was able to preserve only two of these. One is pure white, and about the size of a Sparrow-hawk, a very active bird, and in constant pursuit of all the other sorts, which invariably shun its society.

The *Magpie*, so common with us, and abundant also in the upper part of the country at all seasons, is very rare near the coast; there seems to be no specific difference between it and the bird of *Europe*, except that this is larger, and the feathers in the tail of the male are of a brighter and more azure purple. The American Magpies have the same trick as our's of annoying horses which have any sore about them. I preserved a pair of them.

The *Wood Partridge* is not a rare bird, although by no means so abundant as many of the tribe on the other side of the Continent. These birds frequent dry gravelly soils on the outskirts of woods, among hazel-bushes and other brushwood; but are so shy that the breaking of a twig is sufficient to raise them, and as they generally harbour in the low thicket, it is only by a chance shot on the wing that they can be secured. I preserved two pairs of this fine species, but had the misfortune to lose one of the males, which could not afterwards be replaced, by the depredations of a rascally rat, who mutilated it so much as to render the specimen unfit for sending home. On the Multnomak River there is a species of Partridge, very diminutive in size, not so large as an English Thrush, with a long azure crest, and head and neck of the same hue, the rest of the bird being

an uniform pea-grey. I have not seen it myself, but have provided one of the hunters with shot to procure it for me.

In the upper country are two or three kinds of *Grouse;* one a very large bright grey bird, as large as the smaller size of Turkeys, is plentiful and easily procured; another, about the size of a hen, of a blackish colour, is also abundant, it cackles exactly like the domestic fowl, and never flies, but runs along the ground.

The *Large Grouse* I have not seen alive, but often observed its tail-feathers, and part of the skin, decorating the war-caps of the Indians from the Interior.

A species very distinct from the *Cuculus cristatus* of Wilson, is the *Small Blue Jay* (*Garrulus Stelleri ?*, Vieillot); indeed I do not remember to have read any description at all according with it. Unlike the common Jay of our country, which is very shy, and in autumn is seen in large flocks, but never near houses, the Jay of the Columbia is very tame, and visits the dunghills of the Indian villages, like an English robin, sometimes thirty or forty of the birds coming together. It is of a darker blue than the European kind, and has a black crest. Three of them are preserved.

The *Large Horned Owl* seems not very abundant, I never saw more than twelve or fourteen. One I killed by the light of the moon, having watched for it during several successive evenings; it was not, however, the species I was in quest of, which is much larger than the Snowy Owl, and of a yellowish brown colour.

There are two species of *Crow*, one large and the other small; the lesser kind is shyer and not so abundant, being only seen on the banks of rivers and near old encampments, where it feeds upon carrion. This bird is in my collection; it was killed in February.

In the *Wild Fowl* there appears little difference from what generally inhabit the wild districts of America. The *Common Canadian Wild Goose* (*Anas Canadensis ?*), with the *Grey* or *Calling Goose*, and the *Small White Goose*, are abundant on all the lakes, marshes, and low grounds, as well as on the sand-banks in the Columbia. They migrate to the northward in April, and return in October. The male of the Grey Goose is a handsome mottled bird. A pair of each of these Geese is in my collection.

There are perhaps three species, or else distinct varieties, of the *Swan.* First, the *Common Swan*, then a smaller kind of the same colour; and thirdly, another, equal in size to the first, bluish grey on the back, neck, and head, and white on the belly; it is probably specifically distinct, as the colour is preserved in all stages of its growth, and it is not so common as the rest. All these frequent like places as the Geese, and migrate at the same time. To my regret, I was only able to obtain one specimen, a female of the last species.

Of the ten or twelve species of *Ducks* found on the Columbia, I could obtain but three.

My desire of preserving animals and birds was often frustrated by the heavy rains that fell at this season. Among the kinds of the latter which chiefly deserve attention are, *Tetrao Sabini* and *Richardsoni, Sarcocamphos Californica, Corvus Stelleri*, and some species of the genus *Anas.* There are several kinds of *Cervus, Canis, Mus*, and *Myoxus*, though the variety of quadrupeds is by no means so great in the North-West as in many other parts of America.

The *Elk* (*Cervus Alces*), which the hunters say agrees precisely with the *Biche* of the other side of this great Continent, is found in all the woody country, and particularly abundant near the coast. There are two other species of *Deer*—one is light grey, white on the belly and inside the legs, with a very long tail, a foot to fifteen inches long. It is called by the hunters, *le Chevreuil*, or *Jumping Deer* (*Cervus leucurus*), and is very small, with horns about eighteen inches long, and much curved inwards, very round, and not more than once or twice branched.

The other species is the *Black-tailed Deer* (*Cervus macrotis* of Say), of a darker hue on the back, and bluish grey, the belly

yellow; its tail is shorter, not exceeding from eight inches to a foot, and the ears remarkably large, much like those of an Ass, and of the same dark colour as the tail. This is a considerably larger animal than the *Chevreuil,* and less plentiful; both are found in the upland countries, all through the great range of mountains which extend across the lands of the Snake and Flat-head Indians. I sent last October to England a young *Chevreuil,* which I had killed on the Multnomak River, where these creatures are remarkably abundant. As nothing could be more interesting to me than a knowledge of this genus, I have instructed several of the hunters in the mode of preparing the skin, and furnished them with a small quantity of preserving powder; so that I do hope to obtain at least a pair of each.

There are two sorts of *Rabbit* and one of *Hare,* but none of them have I seen alive; the latter, which is only found in the Interior, is said to be very large.

On the Multnomak there is a most singular kind of *Fox,* smaller than any other, except the White Fox of North-East America, its extreme length being only from thirty-three to forty inches. The hair is remarkably short, and very coarse, and what is most singular, each hair is brown at the bottom, white in the middle, and black at the points, which gives the creature a light grey colour; the belly white, and the sides of the neck and body, as well as the forehead, brown; the ears and nose somewhat black, and it has a grey beard and a black stroke from the shoulders to the tip of the tail. The propensity which this Fox exhibits for climbing trees distinguishes it from all the other species; he mounts with as much facility as a Squirrel. The first I saw was on the Multnomak, where this kind of Fox is by no means rare.

A large *Lynx* (*Felis rufa, Richardson* and *Guldenst.*) was started by Mr. M'Leod and me when we were on a hunting excursion in the month of February. The small Bull-dog belonging to that gentleman caught it by the throat and killed it without any further trouble. It was a full-grown female, and the skin not being much injured, I mean to have it neatly preserved.

Several kinds of *Mice* and *Rats* are found on the banks of the rivers, but I have been unable to catch any more of a singular species with pouches, of which large numbers had visited us last autumn. The *Ground Rat,* or *Arctomys* (*Arctomys brachyurus?*), of whose skins the Chenook and other tribes of Indians make their robes, I hear are plentiful in the upper parts of the Cowalidsk River, but my enfeebled state when I was there last November prevented my hunting for any, and my subsequent attempts have been unsuccessful.

On the Multnomak River, about thirty-six miles above its junction with the Columbia, there are fine Falls, about forty-three feet in perpendicular height, across the whole river in an oblique direction; when the water is low, they are divided into three principal channels, but when it is high the whole stream rushes over in one unbroken sheet. This place was at one time considered the finest hunting-ground for *Beaver* (*Castor Fiber, var. Americanus*) West of the Rocky Mountains, and much have I been gratified in viewing the lodges and dams constructed by that wise and industrious little animal. The same place is frequented by large numbers of a species of *Deer* (probably the *Cervus Wapiti* described as having been seen by Capt. Franklin's party); but though seventeen of these creatures, male and female, were killed during a stay that I made there in autumn 1825, only a small young male, about four months, could be ceded to me for preservation, owing to the great scarcity of provision.

The quantity of *Salmon* (*Salmo Scouleri? Richardson*) taken in the Columbia is almost incredible, and the Indians resort in great numbers to the best fishing spots, often travelling several hundred miles for this purpose. The salmon are captured in the following manner:—Before the water rises, small channels are made among the rocks and stones, dividing the stream into

branches, over which is erected a platform or stage on which a person can stand. These are made to be raised, or let down, as the water falls or rises. A scoop net, which is fastened round a hoop and held by a pole twelve or fifteen feet long, is then dropped into the channel, which it exactly fits, and the current of the water carrying it down, the poor salmon swims into it without being aware, when the individual who watches the net instantly draws it, and flings the fish on shore. The handle of the net is secured by a rope to the platform, lest the force of the water should drive it out of the fisher's hand. The hoop is made of *Acer circinatum*, the net of the bark of an *Apocynum*, which is very durable and tough, and the pole of Pine-wood. The salmon is of good quality, generally weighing from 15 to 25 lbs., sometimes more. I measured two—the first was three feet five inches long from the snout to the tip of the tail, and ten inches broad at the thickest part, it weighed 35 lbs.: the other was three feet four inches in length, nine inches broad, and a little lighter. Both were purchased for two inches of tobacco (about half an ounce), and value two pence. In England the same quantity of salmon could not be obtained under £2 or £3, nor would it eat so nicely crisped (a great point with epicures) as mine has done; when cooked under the shade of a princely Pine far removed from the abodes of civilized life. It is wonderful how much comfort, at least how much of the feeling of it, can consist with such a place, and under such circumstances, where I have been surrounded by hundreds of individuals who had never seen such a white face as mine before, and whose intentions, were I only to judge by their weapons and appearance, were very hostile. Great was their astonishment when, after having eaten my salmon, I prepared an effervescing draught, and swallowed it, *boiling*, as they believed. Their belief in good and bad spirits made them consider me as one of the latter class, and when, besides drinking this "boiling water," they saw me light a tobacco-pipe with my lens, they called me *Olla Piska*, which in Chenook language, signifies *Fire*. A pair of spectacles which I placed on my nose, caused no less surprize, and the hand was immediately laid on the mouth in token of dread and astonishment. On sandy shores the salmon is caught as in England, with a draught-net, also made of *Apocynum* bark, and floated with bits of wood, particularly where the bottom of the river is free from rocks or stumps.

The *Sturgeon* (*Accipenser transmontanus, Richardson*) attains a length of ten feet, and a weight of 400 to 500 lbs. in the Columbia. One of these was presented me by my Indian friend, Cockqua, some months ago, and as to eat the whole was a feat even surpassing the powers of "one of King George's Chiefs," I requested him to select the part which he considered the best, and cook it for me. This request he took as a great compliment, and I must do him the justice to say that he afforded me the most comfortable meal I had enjoyed for a considerable time, out of the head and spine of this fish.

A small *Trout* is also found abundantly in the creeks of the Columbia.

Among the most interesting of the plants which I gathered last year, is a species of Tobacco, the *Nicotiana pulverulenta* of Pursh, correctly surmised by Nuttall to grow on this side of the Rocky Mountains; though whether this country, or the Rocky Mountains themselves, or the banks of the Missouri, be its original habitat, I am quite unable to say. I am, however, inclined to think that it is indigenous to the mountains, where the hunters say that it grows plentifully, especially in the country of the Snake Indians, who may have brought it from the head-waters of the Missouri, which they annually visit, and distributed it thus in both directions, East and West of the Great Chain of the Rocky Mountains. I first saw a single plant of it in the hand of an Indian at the Great Falls of the Columbia, but though I offered two ounces of manufactured tobacco, an enormous remuneration, he would on no account part with it. The *Nicotiana* is never sowed by the Indians near the villages, lest it should be

pulled and used before it comes to perfect maturity; they select for its cultivation an open place in the wood, where they burn a dead tree or stump, and strewing the ashes over the ground, plant the tobacco there. Fortunately, I happened to detect one of these little plantations, and supplied myself, without delay or immediate stipulations for payment, with both specimens for drying and seeds. The owner, whom I shortly met, seeing the prize under my arm, appeared much displeased, but was propitiated with a present of European tobacco, and becoming good friends with me, gave the above description of its culture, saying that wood-ashes invariably made it grow very large.

I was much disappointed at being unable to obtain cones of a fine *Pinus* which grows abundantly on the banks of the Columbia. The trees were too large to be felled with my hatchet, and, as to climbing, I had already learned the propriety of leaving no property below, on such occasions. The top of the tree, where the cones hang, was also too weak to bear me, and its height so great, that all my attempts to bring them down by firing at them with swan-shot were unsuccessful.

On the 20th of February, Jean Baptiste M'Kay, one of the hunters, returned to the establishment from his hunting excursion to the southward, and brought me one cone of the species of *Pinus*, which I had requested him to procure last August, when I was at the Multnomak. The first knowledge I had of this grand tree was derived from the very large seeds and scales of the cone which I had seen in the Indian's shot-pouch. After treating the latter to a smoke, which must be done before any questions are put, I inquired and found that he had brought this prize from the mountains to the southward, and as M'Kay was going in that direction, I begged him to procure me twelve cones, a bag of seeds, a few twigs and some of the gum. Being, however, late in autumn ere he arrived at the place where the trees grow, all the seed was gone, and he therefore brought only a cone to show me; but as he gave strict orders to his Indian friends, I feel certain of securing abundance of it in the summer. This species belongs to Pursh's second section; the tree measures from twenty to fifty feet in circumference, and is one hundred and seventy to two hundred and twenty feet high, nearly unbranched to within a short distance of the top where it forms a perfect umbel. The trunk is remarkably straight, the wood fine, and yielding a great quantity of resin. Growing trees, which have been burned by the natives to save the trouble of felling them or of collecting other fuel, a practice to which they are greatly addicted, produce a quantity of a saccharine substance, used for seasoning in the same way as sugar is by civilized nations. The cone measured sixteen inches and a half in length, and was ten inches round at the thickest part. The country of the Umptqua Indians, two degrees South of the Columbia, produces this tree in the greatest abundance. The seeds are collected in the end of summer, dried, pounded, and made into a sort of cake, which is considered a great dainty. To my inquiries respecting it, the poor Indian answered by repeated assurances that he would give me plenty of this cake when I visited his country, which is the surest proof of its being much prized, as these people will, on every occasion, offer the greatest rarity or delicacy to a stranger. The same person brought me also an Elk's snare and a netted purse of ingenious workmanship, made of a most durable grass, which, from what I have seen, will probably prove a new species of *Helonias*. Of this plant he has also promised to procure me roots and seeds.

SUMMER EXCURSIONS ON THE COLUMBIA RIVER.

Mature consideration of what I have been already able to effect in this country, and of the great amount that yet remains to be done, has satisfied me of the propriety of remaining here for another year, that I may explore it more satisfactorily. I feel that I should otherwise be neglectful of the interests of the Society which sends

me, though I am so doubtful whether my determination will meet with the approbation of my employers (though not doubtful of the integrity of my motives), that I will cheerfully labour this season without any remuneration, if I am only allowed a small sum of money to supply myself with clothing. Thus I hope my conduct will be pardoned, if not approved. Two considerations weigh much with me. Firstly, I involve the Society in little or no expense; and secondly, having been an invalid during the latter part of the seed-harvest, I have, of course, missed of procuring many things which it would be most desirable to possess, particularly of the vegetation of the Upper Country, towards the head-waters of this river, and the boundless tracts that lie contiguous to the Rocky Mountains.

I could have crossed the Continent this season to Montreal, and would most gladly have done so, but for the considerations just mentioned. Should circumstances forbid my accomplishing this desirable object in the spring of next year (1827), I shall, without further delay, embrace the earliest opportunity of returning to England by sea, but the length of time consumed by the voyage renders me unwilling to do this. The expected arrival in September of George Simpson, Esq., Governor of the Western Districts, gives me hope that I shall not be subjected to this unpleasant necessity.

During this spring and summer, therefore, my head-quarters will be either Walla-wallah, the lowest, Spokan, the middle, or Kettle Falls, the highest, on the Columbia and its branches. At each of these places I shall make such a stay as seems desirable, and the extreme distance not much exceeding five hundred miles, frequent journeys between them can be effected without difficulty. A vessel may shortly be expected on this coast, and as I shall not return hither, probably, before November, I mean to leave the whole of my collection ready packed, to be transmitted by her to England, reserving a package of seeds which it is my intention to carry across the country to Hudson's Bay.

March 1st to 20th. This time was devoted to accomplishing the package into two boxes of the residue of my collection, and making preparations for my journey into the Interior, and the continual rains which fell enabled me to work at this job the more assiduously. The kindness of Mr. M'Loughlin enabled me to take thirty quires of paper, weighing 102 lbs., which, with the rest of my other necessary articles, is far more than I could have ventured to expect, considering the labour and difficulty which attend the transportation of luggage over the portages, &c.

In company of John M'Leod, Esq., a gentleman going to Hudson's Bay, and Mr. Francis Ermetinger, who was bound for the Interior, with two boats and fourteen men, I started from Fort Vancouver, on Monday, the 20th, at four o'clock at noon. Owing to the rain and adverse wind, and a strong current against us, it was the evening of the next day before we reached the Grand Rapids. Here the scenery is grand beyond description. The high mountains are covered with Pines of several kinds, some of great magnitude, with their lofty wide-spreading branches loaded with snow; while a rain-bow stretches over the vapour formed by the agitated waters, which rush with furious speed over the shattered rocks and through the deep channel of the stream, producing a melancholy though pleasing echo through the still and woody valley, where the vivid green of the Pine contrasts agreeably with the reflection of the snow.

On Thursday the 23rd, we proceeded on our voyage with a strong westerly wind, which enabled us to hoist a sail, and reached the lower part of the Great Falls at dusk, where we camped in a small cove, under a shelving rock. Fortunately the night was fine, and the moon bright, which was the more agreeable, as the wind would not allow of our tent being pitched. Here we were placed in a dangerous predicament, from the natives, who collected in unusually large numbers, and showed every disposition to be troublesome, because they did not receive so ample a supply of to-

bacco as they had expected. We were obliged to watch the whole night. Having a few of my small wax tapers, on which I lay a great value, still remaining, I lighted one, and sat down to write to Mr. Murray of Glasgow, and to arrange in paper some Mosses that I had collected the preceding evening. Day-light was a most gladsome sight, as may be imagined, after spending the hours of darkness surrounded by at least four hundred and fifty savages, whose manners announced any thing but amicable feelings towards us. As no one in the brigade could converse with them much better than myself, little could be done by persuasion. However, discovering that two of the principal men understood the Chenook language, which I am slightly acquainted with, I found this circumstance of some advantage. After taking a hurried and anxious breakfast on the rocks, we proceeded several miles up the river, and in the afternoon made the portage over the Great Falls, where Mr. M'Leod was apprized that the Indians were lying in wait with the intention of attacking us and pillaging the boats. This warning proved too correct. No sooner had they received the customary present of tobacco than they became desirous of compelling us to encamp for the night, that they might the better effect their purpose. The first symptom of hostile intentions which we observed, was their cunning trick of sprinkling water on the gun-barrels of our party; and, when the boats were ordered to be put into the water, they would not allow it to be done. As Mr. M'Leod was laying his hand on the shoulders of one native to push him back, another fellow immediately drew from his quiver a bow and a handfull of arrows, and presented it at Mr. M'Leod. My position at the time, at the outside of the crowd, enabling me to perceive this manœuvre, and no time being to be lost, I instantly slipped the cover off my gun, which was fortunately loaded with buck-shot, and presenting it at him, I invited him to discharge his arrow, when I would return it with my own weapon. Just at this moment, a Chief of the Kyemuse tribe, and three of his young men, who are the terror of all the other tribes West of the mountains, and the staunch friends of the white people (as they call us), stepped in among the party and settled the affair without any further trouble. This very friendly Indian, who is one of the finest figures of a man I have ever seen, standing six feet six inches high, then accompanied us several miles up the river to the spot where we intended to encamp for the night, and was liberally remunerated by Mr. M'Leod for his courageous and timely interference and friendship. I being King George's Chief, or the "Grass Man," as I am called, bored a hole through the only shilling which I possessed, and which had been in my pocket ever since I left London, and observing that the septum of his nose was perforated, I suspended the coin to it by a bit of brass wire, a ceremony which afterwards proved a seal of lasting friendship between us. After smoking with us, our friend left us to return to the Indian village, promising that he would not allow us to be molested. As we could not, of course, think of sleeping that night, I employed myself in writing a letter to Dr. Hooker.[1]

[1] LETTER TO DR. HOOKER.

"Great Falls of the Columbia River,
March 24th, 1826.

"DEAR SIR,

"From Dr. Scouler you must have obtained a good description of North-West America, and be made acquainted with many of its treasures. He left me in fine spirits; and when we were together, not a day passed in which you were not spoken of. His departure I much regret; we had always been friends, and here our friendship increased. When botanizing along the shores of the Columbia River and in the adjoining woods, we would sometimes sit down to rest our limbs, and then the conversation often turned on Glasgow and Ben Lomond. If a favourite Moss caught his eye, and was eagerly grasped and transferred to the vasculum, the remark was pretty sure to follow, 'how much would Dr. Hooker like to be with us!' I felt very lonely during the first few weeks after Dr. Scouler had sailed.

"The upper country here appears such an interesting field, and so different from the vegetation that prevails along the coast, that I have determined to devote the whole of this year to exploring it; though somewhat doubtful whether I am justified in so doing, as my orders were strict from Mr. Sabine not to outstay the departure of the ship which leaves the mouth

The next morning, the 25th, this disagreeable business being settled, we started at daylight, and continuing our upward course during the three next days, reached the Walla-wallah Establishment on the 28th, where I was received with much kindness by Mr. S. Black, the person in charge. The whole country between this place and the Great Falls is nearly destitute of timber, the largest shrub being *Tigarea* (*Purshia* of the *Flora Boreali Americana*) *tridentata*, which we use for fuel in boiling our little kettle. I also noticed several large species of *Artemisia* (*A. arborea*, among them) that were new to me, and indeed the whole aspect of vegetation is quite dissimilar from that of the coast. To the South-east, at a distance of ninety

of the Columbia in 1826. I trust, however, that my arrangements will meet his approbation, or at least, not incur his displeasure. The probability is, that I shall be enabled to reach the Rocky Mountains in August, when, with what I may previously obtain, I hope to have a most splendid collection.

"During the past winter, I have been continually picking up *Musci* and *Jungermanniæ*, and forming a collection of birds and other animals. My knowledge is somewhat limited in these families, so that I hardly dare to pronounce as to what may be new; but I take care to secure every thing I can lay my hands upon. It would have been in my power to make my way to Montreal this season, and would have gladly embraced the opportunity of seeing such an extensive and interesting country as lies between; but to overlook the inviting prospect now before me, was more than I could do. I rejoice to tell you of a new species of *Pinus*, the most princely of the genus, perhaps even the grandest specimen of vegetation. It attains the enormous height of from one hundred and seventy to two hundred and twenty feet, with a circumference of fifty feet, and cones from twelve to eighteen inches long! I possess one of the latter, measuring one foot five inches long, and ten inches round the thickest part. The trunk grows remarkably straight and destitute of branches till near the top, where they form a perfect umbel; the wood of fine quality, yielding a large quantity of resin. Growing trees of this *Pinus*, which have been partly burnt by the natives, to save themselves the trouble of collecting fuel, a custom to which they are greatly addicted, produce a substance which, I am almost afraid to say, *is sugar*; but as some of it, together with the cones, will soon reach England, its real nature will then be correctly ascertained. This *Pinus* is found abundantly two degrees south of the Columbia River, in the country of the Umptqua Tribe of Indians, who collect its seeds in autumn and pound them into a kind of cake, which they consider as a kind of luxury, using also the saccharine substance that I have described above, in the same way as civilized nations do sugar. I intend to bring home such an assemblage of specimens as will allow a correct figure to be taken of this tree, and also to try my success with a bag of its seeds.

"I hope to make some addition to the genus *Phlox*, and to obtain *P. speciosa* (Bot. Reg. t. 1351.), if it be in existence. Of Liliaceous plants I am sure there must be a great variety.

"I heard of Capt. Franklin's party from Cumberland Lake, on the way to Bear Lake, their winter residence. Dr. Richardson did not write to me, as the party who brought me the news only spent a few minutes with them. I learn there is a Mr. Drummond attached to them as Naturalist (whom I take to be Mr. D. of Forfar). He is on the opposite side of the mountains, at Peace River.

"There is here a Mr. M'Leod, who spent the last five years at Fort Good Hope on the Mackenzie River. He informs me, that if the natives, to whom he is perfectly known, can be credited, there must exist a north-west passage. They describe a very large river, that runs parallel with the Mackenzie, and falls into the sea near Icy Cape, at the mouth of which is an establishment on an island, where they go to trade; they say the people of it wear long beards, and are very wicked, having hanged several of the natives to the rigging. Considerable dependence may be placed on these statements, as Mr. M'Leod showed me some Russian coins, combs, and articles of hardware, such as are very different from what can be obtained from the British Trading Company. But the most convincing proof, and which proves the difficulty of transportation or navigation is, their malleable iron pots of coarse workmanship, and containing four and six gallons each. The whole account seems plausible. Mr. M'Leod assembled all the natives last year with the purpose of accompanying him thither, when he was obliged to depart for Hudson's Bay. The sea is said to be open after July. In this gentleman there is an example of what may be done by perseverance, as in the short space of eleven months he visited the Polar Sea, the Atlantic and Pacific Oceans. Perhaps not an individual alive has gone through such a succession of miseries and hardships.

"My intention is to endeavour crossing the Continent of America in the spring of next year (1827; failing which, to take the earliest opportunity of reaching England by sea. My store of clothes is very low; nearly reduced to what I have on my back,—one pair of shoes, no stockings, two shirts, two handkerchiefs, my blanket and cloak: thus I adapt my costume to that of the country, as I could not carry more, without reducing myself to an inadequate supply of paper and such articles of Natural History

P.S. At the junction of the Spokan River with the Columbia, Lat. $47\frac{1}{2}^{\circ}$ N., Long. 119° West, April 13th.—Since writing the above, I have found *Phlox speciosa* of Pursh, a delightful plant, of which the description will require some alteration; and also a new species equal to it in beauty and near *P. setacea*, with abundance of *Purshia tridentata* with yellow flowers. I can hardly sit down to write, not knowing what to gather first.

miles, is seen a ridge of high snowy mountains, which, running in a South-westerly direction for three hundred miles, terminate near the ocean. There I might hope to find all or most of the plants of the Rocky Mountains, and Mr. Black has kindly commenced arrangements for my making a journey thither early in June, which will occupy fifteen to twenty days.

Thursday the 30th. We proceeded early this morning on our way, I walking generally on the bank of the river, as I found the cold very prejudicial to my stiff knee, which was the better for a little exercise. The country, too, was quite a plain, as far as the junction of Lewis and Clarke's River, which is a fine stream, from one hundred and twenty to one hundred and fifty yards wide in many places, and very rapid, abounding, as well as many of its tributaries, with salmon. Its whole course, from its source in the Rocky Mountains till it joins the Columbia, is not less than fifteen hundred miles. The soil in this neighbourhood is a light brown earth, which the wind frequently blows up in mounds or hills fifty feet high, whereon grow several species of *Lupinus* and *Œnothera*, with some singular bulbous-rooted plants, and occasional shrubs of the beautiful *Purshia tridentata*, which is the largest vegetable production seen here. The same aspect of country continues as far as the Priest's Rapid, which we reached on the 1st of April, where it becomes mountainous, with scarcely a vestige of herbage or verdure of any kind, except in the valleys. The rocks which bound the river are of limestone and very rugged, and this is considered one of the most dangerous parts of the whole river. During the time occupied in making the portage of nine miles, I wrote to my friend, Dr. Scouler[1] of Glasgow.

April 2nd to 6th. Continuing our journey without interruption, we reached the

TO DR. SCOULER.[1]

Priest's Rapid, on the Columbia River,
Lat. 48° N., Long. 117° W., April 3rd, 1826.

My dear Sir,

"By this time I hope you are once more in England, and that your long voyage has terminated to your satisfaction. Your friends would, no doubt, naturally entertain melancholy thoughts about you, owing to your absence having proved so much longer than was expected; and I know by experience, how much you must have felt.

Since you left me, there has been no person to join me in my walks, and for several weeks I felt very uncomfortable, being especially grieved at not having seen you before your departure, owing to a hurt that one of my legs received when packing my boxes, and which has troubled me, I am sorry to say, almost ever since. Although in a state very unfit for enduring much exertion, I left Fort Vancouver on the 22nd of October, for the purpose of seeing you in my way to Whitby's Harbour, near the Cheeheelie River. On the evening of the 23rd I put ashore at Oak Point to procure a little food, where an Indian gave me your letter, in which you stated your expectation of remaining a few days longer, and as the ship had been seen on that day, I lost no time in boiling my kettle, and having re-embarked at 11 P. M., I was in hopes of reaching the bay before daylight. Unfortunately, the wind was adverse, and my Indians being much fatigued, I did not arrive till ten o'clock, when I heard, to my great disappointment, that you had left the river only one hour before. I found Tha-a-mu-ü, or "the Beard," Com Comly's brother, to whom you had spoken of me. He is an old man: at his request I shaved him, that he might look more like one of King George's Chiefs. He accompanied me all the way along the coast, and for sixty miles up the Cheeheelie River, where I crossed a tract of land, near Mount St. Helen's, to the Cow-a-lidsk River, which I descended to its junction with the Columbia. This was the most unfortunate trip I ever had; the season being so late, and my knee becoming more and more troublesome, I was under the necessity of laying by, as an invalid, for three days, on Cape Foulweather, in a hut made of pine-branches and grass. Being unable to go abroad and shoot, I fared, of course, but scantily; some specimens of *Procellaria*, *Larus*, and one of *Colymbus* which I killed, were spoiled by the excessive rain. The only plant I found, worthy of notice, was an *Eriogonum*, and I also procured the seeds of several kinds previously in my possession, among them *Helonias tenax* and a fine large-fruited species of *Carex*. This excursion took twenty-five days, and reduced me to such a state of weakness, that I could do little more for the season. During the winter, in the short intervals of fair weather, I crawled to the woods, in search for Mosses, but my knowledge of this tribe of plants is insufficient to enable me to determine accurately what they are. I lost no time in forming a collection of birds, as nothing could be done in Botany; my sight, however, which was always weak, is much impaired during the last few months; without pain or inflammation, a dimness has come on which is a great loss to me, especially in the use of the gun, which, as you know, I could handle to some advantage. I am in possession of a species of *Pinus*, the finest of the genus, and hope soon to have abundance of better specimens and

Establishment on the Oakanagan River, one of the Northern branches of the Columbia, where we were kindly received by the Factor, Mr. Annance, but the ground being covered three or four feet deep with snow, nothing could be done in the way of Botany, and my attempts to secure specimens of the *Wild Grouse* of the country were also unsuccessful. I observed a beautiful yellow *Lichen* growing on the dead brushwood.

April 9th. My companions and I resumed our route early this morning, sometimes walking and sometimes on horseback where the portages were very long and rugged, and on Tuesday, the 11th, arrived at the junction of the Spokan River with the Columbia, where we found John W. Dease, Esq., who, with fourteen men, was on his way to the Kettle Falls, ninety miles higher up the Columbia, the furthest of the three points, which I designed to make my head-quarters for the summer and autumn. The great kindness and attention this gentleman showed me contributed no little to my comfort. He is brother to the person of the same name who is now accompanying Capt. Franklin on his second Arctic Land Expedition.

This part of the Columbia is by far the most beautiful and varied I have yet seen; the plains are extensive, but studded with Pine-trees, like an English lawn, with rising bluffs or little eminences clothed with small brushwood and rugged rocks sprinkled with Ferns, Mosses, and Lichens.

Two or three days were here devoted to drying my paper, which had got wet, arranging my plants, and writing to Mr. Sabine, my brother, and Mr. Munro, which notes I delivered to Mr. M'Leod, who starts to-morrow, the 14th, for his long trip to Hudson's Bay, and has most kindly engaged to convey my tin box of seeds, and a few other articles which he will consign to Mr. M'Tavish. I also met Mr. John Wark here, from whom I received much attention last year. In a few days I intend proceeding to the Kettle Falls, where I shall make such a stay and such excursions as best promise to accomplish the objects of my employers.

Among the most interesting plants which I have just gathered, is one of a genus perfectly distinct from *Lilium* (though apparently the *L. pudicum* of Pursh), as its style is invariably three-cleft. It is abundant in light dry soil, every where above the Falls. I shall try to preserve its bulbs, as it is highly ornamental. The natives eat the roots both raw and roasted on the embers, and collect in July a large store of them, which they dry in the sun, and lay by for winter use. A lovely *Dodecatheon* is also plentiful here, growing with a white variety: when these pretty flowers are seen together, they lend a grace to the scanty herbage of American Spring that agreeably recalls to mind "the wee crimson-tipped flower," and "the faint primrose-beds" of my native land.

From Sunday the 15th to Wednesday the 19th, I continued making several trips in the country contiguous to the junction of the Spokan River, and this more for the sake of viewing the general aspect of the soil, and estimating its future productions than for any object of Natural History that I might now pick up, the season being too early in spring to afford much.

Wednesday the 19th. On this day, at noon, I accompanied Mr. Dease, who w

ripe seeds. [Here follow the details, which are precisely similar to what Mr. D. had mentioned in his foregoing letter.] This is unquestionably the most splendid specimen of American vegetation—what would Dr. Hooker give to dine under its shade? As for Mr. Lambert, I hardly think he could eat at all, if he saw it.

I possess another species of *Mimulus*, a fine plant, but not equal to yours. In the middle of this month I quitted the ocean, and might have crossed the Continent this season, but from what I had seen of the country lying towards the head-waters of the Columbia River, I could not think of forsaking such an inviting field, or departing so far from the interests of the Society by which I am employed. I expect to reach the mountains in August. How glad I shall be to join you in our usual trip of Ben Lomond, where we shall have more time and a keener relish for talking over our journeys in North-West America. Mr. M'Donald is gone to Thompson's River, in the interior.

Pardon the shortness of this note, as I have neither time nor conveniences for writing—no table nor desk: this is penned on the top of my specimen board, under which are some exceedingly interesting things."

two boats and a party of fourteen men, was proceeding up the river to a new settlement, called Fort Colville, near the Kettle Falls, ninety miles further on. The whole distance is mountainous and rugged, becoming increasingly so as we approach the territory of the Rocky Mountains. Many kinds of Pine are seen on the banks, three species particularly,—*P. resinosa*, a *Pinus*, very similar to *P. taxifolia* of the coast, and *P. Larix*, the latter more numerous than the others, and attaining a great size: I measured some thirty feet in circumference; and several which had been levelled to the ground by the late storms, were one hundred and forty-five feet long, with wood perfectly clean and strong. A thick sward of grass covered the ground, interspersed with shrubs which at this early season it was impossible to determine. The hills are still partially clothed with snow, and while the days are warm, the cold is severe at night. The greatest elevation of the thermometer was 65°, and its minimum 28°, during the twenty-four hours; a striking difference! During this voyage we met with several parts of the river where the Rapids obliged us to make long and difficult portages, sometimes three in a day. We generally started very early, breakfasting a little before noon, and continued our progress till dark, about seven o'clock, when we camped for the night, and found our suppers of salmon and dried buffalo-meat highly acceptable.

Saturday the 22nd. Arrived this night at the Kettle Falls, where the whole stream is precipitated over a perpendicular ledge, twenty-four feet high, besides several smaller cascades, which shiver the water into the most picturesque snowy flakes and foam for the distance of one hundred and fifty yards, where a small oval rocky island, studded with a few shrubs and trees, separates the channel in two.

Here I spent between a fortnight and three weeks, making short daily excursions, during which I obtained some interesting plants, and killed several birds that I had not before seen in the country. Among these was a pretty black species of *Partridge*, which at this season was not at all shy, and of which I secured three specimens; a small *Pheasant* and a *Curlew*, apparently quite distinct from the European species, being never seen near marshy places, but abundant in dry ground, where it lays its egg on the bare soil. The plants that pleased me best, were *Erythronium grandiflorum* of Pursh (*Bot. Reg. t.* 1786), which is extremely beautiful, especially when seen growing, as is commonly the case, with the *Dodecatheon* mentioned before, and with a small species of *Pulmonaria;* also *Claytonia lanceolata*, of which the roots, though insipid, are eaten by the poor Indians, both raw and roasted; two species of *Rosa*, and a lovely evergreen shrub, probably a *Clethra*,[1] which is abundant in the woods here, and I trust may yet be equally so in the shrubberies of Britain.

Tuesday, May 9th. Having apparently exhausted all the objects of interest which the very early season of the year afforded in this vicinity, I quitted the Kettle Falls of the Columbia, and taking two horses loaded with my provisions, which consisted of dried buffalo meat, tea, and a little sugar, and with my blanket and paper (by the aid of these animals also hoping to get an occasional lift over the worst places of my route) I set out across the mountains, for the abandoned Establishment at Spokan, distant about one hundred and ten miles. My object was to see Mr. Jacques Raphael Finlay, a Canadian Sauteur, now resident there, who is possessed of extensive information as to the nature of the country, its animals, vegetable productions, &c. To him Mr. Dease kindly gave me a note of recommendation, and I had for my guides his two young sons. The melting of the snow, which swelled the mountain rivulets into angry torrents, rendered our way difficult and circuitous; often the meadows were so overflowed that the ground would not bear the horses, which became much fatigued by their exertions and frequent falls among the rocks. After travelling about twenty-seven miles, we camped

[1] No *Clethra* appears in any of Mr. D.'s collections.

for the night, and starting by daylight of the next morning (Wednesday 10th), reached at noon a small, but very rapid river, called by the Indians, Barrière River, having travelled for seven hours without food. No natives being near to help us across in their canoes, my two young companions and I had the alternative of making a raft or swimming, and being all well accustomed to the water, we chose the latter. Unsaddling the horses, we drove them in, and they all crossed with safety and ease, except one poor animal, which getting entangled by its hind legs, among some brushwood at the bottom, struggled for a long time, till the impediment giving way, he finally relieved our anxiety by gaining the other side. I myself made two trips across, carrying my paper and gun the first time, and my blanket and clothes the second;—the latter articles I was obliged to hold above water in both my hands, a difficult and tedious process, during which, as if to render my labour fruitless, it hailed heavily. When I landed, my whole frame was so completely benumbed, that we were under the necessity of stopping to kindle a fire, and to indulge my guides with a smoke, after which we proceeded. At night, a severe pain between my shoulders and general chilliness kept me from sleeping. I rose, boiled my kettle, and made some tea; then dried my blanket, and substituted for my damp shirt a spare one in which I had rolled my plants; but feeling no better, and being unfortunately without medicine, I started on foot at a little before four, and driving the horses before me, got into a profuse perspiration, which considerably relieved my sufferings.

Near this spot was an Indian burying-ground, certainly one of the most curious I had yet seen. All the property of the deceased was here deposited near their graves, their implements, garments, and gambling articles. Even the favourite horse of the deceased is not spared; it is customary to shoot the animal with a bow and arrow, and suspend the skin, with the hoofs and skull, just above the remains of his master. On the trees which are round the burying-place, small bundles may be seen, tied up in the same manner as the provisions which they carry when travelling. I could not learn whether this was intended as food for the dead or propitiatory offerings to the divinities. Within the grave the body is placed in a sitting posture, with the knees touching the chin, and the arms folded across the chest. It is difficult to gain any information on these subjects, as nothing seems to hurt the feelings of these people so much as alluding to their departed friends.

Thursday the 11th. At seven this morning we gained the summit of the last range of hills which lie between the Columbia and Spokan Rivers, and beheld one of the most sublime views that could possibly be, of rugged mountains, deep valleys, and mountain-rills. At noon reached the old Establishment, where Mr. Finlay received me most kindly, regretting at the same time that he had not a morsel of food to offer me, he and his family having been subsisting for several, at least six, weeks on the roots of *Phalangium Quamash* (*Scilla esculenta*, Bot. Mag. t. 2774), called by the natives all over the country, *Camass*, on those of *Lewisia rediviva*. (Bot. Misc. t. 70), and on a black *Lichen* (*L. jubatus*), which grows on the Pines. The mode of preparing the latter is as follows:—after clearing it thoroughly from the dead twigs and pieces of bark to which it adheres, it is immersed in water, and steeped till it becomes perfectly soft; when it is placed between two layers of ignited stones with the precaution of protecting it with grass and dead leaves, lest it should burn. The process of cooking takes a night, and before the lichen cools, it is made into a cake, much in the same way as the *Phalangium Quamass*; when it is considered fit for use. A cake of this kind, with a bason of water, was all that Mr. Finlay had to offer me. Great, therefore, was my pleasure in being able to requite his hospitality by giving him a share of the provision with which Mr. Dease's liberality had supplied me, and which, though far from luxurious fare, was yet the best the

he and his family had tasted for a long time. I had also some game in my saddle bags, which I had killed by the way, and of which I gave him half. The principal object of my visit to Mr. Finlay was to get my gun repaired, and as he was the only person who could do it, within a distance of eight hundred miles, and this article being a matter of, perhaps, vital importance to me, I hastened to inform him of my request, though my imperfect knowledge of French, the only language that he could speak, much limited our intercourse, and prevented my deriving from him all the information that I wished to obtain. Having taken a walk up the river in the afternoon, I found, on my return at night, that Mr. Finlay had obligingly put my gun into good order, for which I presented him with a pound of tobacco, being the only article I had to give.

Two days were devoted to botanizing in this neighbourhood, where I found three fine species of *Ribes* in flower: the *R. aureum,* which bears, as Mr. Finlay informs me, a very large and excellent yellow berry (he never saw it black or brown, though I afterwards found this variety); a white-blossomed, apparently new species, whose snowy and fragrant long spikes of flowers are enough to recommend it for culture in England, even without considering its abundant produce of well-flavoured and black currants, which resemble those of our country, except in being rather more acid; and another kind, with a green flower, that is succeeded by a small black gooseberry. Of all these, and many other plants, I engaged Mr. Finlay to collect specimens and seeds for me; as well as of an interesting kind of *Allium,* which grows about forty miles distant, and of which the roots, that I saw, were as large as a nut, and particularly mild and well tasted.

These species of the *Ribes* I afterwards found to be *R. viscosissimum* (Hook. Fl. Bor. Am. v. 1. t. 86), *R. petiolare,* and *R. tenuiflorum* (Bot. Reg. t. 1274).

I also saw a new *Pinus* (*P. ponderosa*), and two kinds of *Misseltoe,* one large and growing on this Pine; and the other a smaller plant (*Arceubothrium Oxycedri, Hook. Fl. Bor. Am. v.* 1. *t.* 99), parasitical on *Pinus Banksiana,* which is not rare here, though of smaller stature than it attains on the other side of the Rocky Mountains. A large Bear, *Ursus horribilis,* was killed by Mr. Finlay, but it was too large to be preserved. Among the seeds I procured, were those of *Pentstemon Scouleri* (*Bot. Reg. t.* 1277), *Claytonia lanceolata, Erythronium grandiflorum* (*Bot. Reg. t.* 1786), and *Rubus Nutkanus* (*Bot. Reg. t.* 1368, and *Bot. Mag. t.* 3453).

Saturday the 13th. As I thought of bending my steps again towards the Columbia, Mr. Finlay offered that one of his sons should escort me, to which I agreed. Before quitting him, I made some inquiry about a sort of sheep found in this neighbourhood, about the size of that described by Lewis and Clarke, but, instead of wool, having short thick coarse hair, of a brownish-grey colour, whence its name of *Mouton Gris,* as it is called by the voyageurs, is derived. The horns of the male, weighing sometimes 18 to 24 lbs., are dingy-white, and form a sort of volute, those of the female bend back, curving outwards at the point, and are from ten inches to a foot long. The flesh is fine, equal to that of the domestic sheep. It inhabits the lofty mountains, and is seldom seen in any numbers except on those whose summits are covered with perpetual snow. Mr. Finlay gave me hopes that when he visited the high mountains further up the country in autumn, he might be able, notwithstanding the shyness of these animals, and the inaccessible places to which they generally betake themselves when disturbed, to procure me a specimen of this highly interesting creature. To Mr. Finlay's sons I offered a small compensation, if they would preserve for me the skins of different animals, showing them at the same time how this should be done.

On my way back from Spokan River to the Columbia, I was obliged to take the same way of crossing the Barrière River as I had done when coming, and again suffered a good deal from the wetness of my clothes,

as I had no change whatever with me. I however added *Ribes viscosissimum* of Pursh (*Flora Boreali-Americana*, tab. 76.) to my collection, which pleased me much, and on the whole felt myself well rewarded for the toils of my excursion, by the many new plants I had gained, and by the advantage of getting my gun properly repaired. For two days, however, after my return to the Establishment at the Kettle Falls, I was so indisposed as to keep my bed with fever and a violent pain between my shoulders, probably occasioned by wet, cold, and fatigue.

Friday the 19th to Thursday the 26th. This time was spent in making several excursions; on one occasion I crossed the Columbia to Dease River, one of its most northerly branches, and which had never before been entered by any European. Mr. Kitson, in a canoe with two Indians, went on purpose to explore it, but after having proceeded ten miles, during which I walked along the banks, that I might better judge of its productions, the stream proved so rapid that we were obliged to give up further progress and return. This river seems, like most of the others, to have its source in the Rocky Mountains.

Friday the 26th. Started at daylight for a trip to the hills south of the Kettle Falls. The weather was warm, thermometer 86°, and sitting down to rest awhile under the shade of a large *Thuja occidentalis*, in a valley near a small spring, I fell asleep and never woke till late in the afternoon, when, being twenty miles from home, I would gladly have taken up my quarters there for the night, but that I feared Mr. M'Loughlin, who expected me back, would be uneasy. I therefore returned with all speed over a mountainous and rugged way, and arrived near midnight, and found him on the point of sending two Indians to seek for me; his anxiety, however, lest any accident should have befallen me, was changed into hearty laughter, when he heard of the manner in which I had been spending my time.

The next week was devoted to collecting specimens of plants, preparatory to leaving this place for a journey to the plains below.

Monday, June the 5th. Rose at half-past two, and had all my articles given in charge to Mr. Dease, and my tent struck before five, when I took some breakfast, and in company with Mr. W. Kitson, bade farewell to the wild romantic scenery of the Kettle Falls. The river is much swollen by the melting of the snow, being fourteen to sixteen feet above its usual level, where it is six hundred yards wide. As soon as our boats got into the current, they darted down the river with the velocity of an arrow just loosed from the bowstring. One half hour took us to Thompson's Rapids, the place where the striking appearance of the shattered rocks and water is noticed in my journal of our ascent. Here our boatman, Pierre L'Etang, observed that the water was in fine order for shooting or "jumping," as he called it, the Rapid. Good as this plan appeared to him, I must confess that my timidity would not allow me to remain in the boat. Although I am no coward either *in* the water or *on* the water, and have gazed unmoved, and even with pleasure, on the wildest uproar and tumult of the stormy deep, yet to descend these cataracts by way of sport and where no necessity called for it, I could not resolve to do. Therefore Mr. Kitson and I got out and walked along the rocks. No language can convey an idea of the dexterity exhibited by the Canadian boatmen, who pass safely through rapids, whirlpools, and narrow channels, where by the strength of such an immense body of water forcing its way, the stream, as in the present instance, is lifted in the middle, to a perfect convexity. In such places, where you think the next moment must dash the frail skiff and its burden of human beings to destruction among the steep rocks, these fellows approach and pass over with astonishing coolness and skill, encouraging themselves and one another with a lively and exulting boat-song. We reached the junction of the Spokan River the same afternoon, having in the short space of eight hours accomplished a distance of ninety miles, which will give some idea of the rapidity of the current; forty miles lower

still we encamped at night, opposite the Cinqpoil River, on the South side of the Columbia; and, soon after mid-day on Tuesday, arrived at the Oakanagan establishment, where I found my old friend, Mr. Wark, with W. Conolly, Esq., M. Pambrun, and a James Douglas, all of whom, with a party of men, were on their way from Western Caledonia to Fort Vancouver, with Mr. F. Ermetinger (brother of the gentleman of the same name who had accompanied me in the spring) coming from Thomson's River.

The next day (Wednesday 7th) I proceeded, with a brigade of six boats, towards Walla-wallah, at the junction of Lewis and Clarke's River, which I intend to make my head-quarters for six or eight weeks. Passed the Stony Islands, where I found *Pentstemon venustum* (*Bot. Reg. t.* 1309) and *P. speciosum* (*Bot. Reg. t.* 1270) a place in the river about half a mile long, exceedingly rugged and dangerous, at four o'clock, and shortly afterwards camped earlier than usual, two of our boats having been broken. This circumstance gave me some hours among the rocks on the banks of the river, which I spent to great advantage. Under some stones I discovered and killed a rattle-snake, three feet long. The thermometer had indicated 92° in the shade at noon, and at night the heavens presented an entire sheet of lightning, unaccompanied either by thunder or rain. The next morning we started, as usual, very early, and breakfasted at the Priest's Rapid, on fresh salmon and buffalo tongue. Arrived at night at the Walla-wallah, where having had very little sleep since leaving Kettle Falls, I hoped to obtain some hours repose, and accordingly stretched myself on the floor of the Indian Hall at that establishment, whence, however, I was shortly driven by the attacks of such an immense swarm of fleas as rendered repose impossible, and my attempts to procure it among the bushes were equally frustrated by the annoyance of two species of ants, one very black and large, three-quarters of an inch long, and the other small and red. Thus I gladly hailed the approach of day, and as soon as I could see to make a pen, wrote the following letter to Mr. Sabine, which I consigned to Mr. Conolly, who was immediately about to proceed to Fort Vancouver, whence a ship was daily expected to sail for England.

June 9th, 1826.

DEAR SIR,

As an unexpected opportunity of communicating with the coast has just presented itself, I thus embrace it, sending also the whole of my gleanings, amounting to upwards of one hundred species, distinct from those transmitted in the collection of 1825. Among them are six species of *Ribes*, two of which, I think, will prove new; *R. viscosissimum* of Pursh (whose description will require some alteration), which is surpassed by few plants; and a fourth, very interesting, though less showy species; the others are *R. aureum*, and one belonging to the section *Grossularia*, with green flowers. A few days after I had the honour of writing to you, on the 12th of April, from the Spokan River (where it joins the Columbia), a letter which was sent across this great continent, I started for the Kettle Falls, ninety miles farther up, where I remained until the 5th of this month, making excursions in such directions as seemed calculated to afford the richest harvest; and although this has fallen somewhat short of my expectations, I yet do not consider my time as having been thrown away, many of the species being new, and the rest but imperfectly known. About the 25th of this month (June) I purpose making a journey to a ridge of snowy mountains, about one hundred and fifty miles distant from this place, in a Southerly direction, which will occupy fifteen to eighteen days; and, after securing the result of this trip, shall make a voyage up Lewis and Clarke's River, as far as the Forks, remaining there ten or twelve days, as appears necessary, and returning overland in a North-Easterly direction to my spring encampment on the Kettle Falls. Shortly afterwards I mean to accompany Mr. Wark, who is going on a trading ex-

cursion, to the country contiguous to the Rocky Mountains, and not far distant from the Pass of Lewis and Clarke, thence gradually retracing my steps over the places I have already visited, or yet may visit, so as to reach the ocean, as I hope, about November.

The difficulty which I find in conveying the different objects that it is desirable to collect becomes considerable, and often I am under the necessity of restricting myself as to the number of specimens, that I may obtain the greater variety of kinds.

I have been fortunate in procuring two pairs of a very handsome species of *Rock Grouse*, found only in mountainous grounds; and as none of this sort are found East of the mountains, I am in hopes it may prove new. A pair of *Curlews*, of singular habits, very unlike the rest of the tribe, which frequent dry soils, and roost on trees, with a small *female Pheasant*, are all that I have been able to get ready for adding to this collection. The birds are packed in a small box, with three bundles of plants. Having so much to do, I find it impossible to send, at this time, a copy of my journal, which I much regret. Among my plants are five splendid species of *Pentstemon*, only one, the *P. cæruleum*, of Pursh, is yet described; abundance of *Purshia tridentata*, both in flower and fruit; several species of *Rubus* and *Lupinus;* and two kinds of *Prunus*, all of these being different from what I sent last year, from the coast. I am now in the finest place for the *Large Grouse*, and hope shortly to procure some.

It always affords me the greatest pleasure to mention the kindness and assistance I receive from the persons in authority here. Thank God, I enjoy excellent health. There is nothing in the world could afford me greater pleasure than hearing from you and my other friends, and most sincerely do I hope that, in the course of the autumn, this may come to pass.

D. DOUGLAS.

To Joseph Sabine, Esq., &c.

I then wrote, and particularly begged the attention of my kind friends, at Fort Vancouver, to the articles which I sent for conveyance in the next ship. Mr. Conolly, before departing with Mr. Wark and the other gentlemen, handsomely presented me with twelve feet of tobacco, more than two pounds, to assist me in my travels during their absence. This article being, as it were, the currency of this country, and particularly scarce, will enable me to procure guides, and to obtain the cheerful performance of many little acts of service, and it is therefore almost invaluable to me.

In this neighbourhood grow several beautiful kinds of *Phlox* and *Pentstemon*, also a fine species of *Eriogonum* (*E. sphærocephalum*) and of *Malva*.

Having, as I before mentioned, taken almost no rest for five nights, I lay down shortly after despatching my letters, but was scarcely composed when an Indian arrived with news that the expected ship had arrived in the river. He brought me a parcel and two letters; the latter I eagerly grasped, and, hoping one was from Mr. Sabine, tore it open, when I found that it was in the writing of Mr. Goode; the other was from my friend, Mr. William Booth.

A note from Mr. M'Loughlin, at Fort Vancouver, diminished my fears lest there should be no more letters for me, by stating that feeling unwilling to confide to the Indian such communications as appeared to come from the Horticultural Society, he had kept them until his own people should return.

Never in my life did I feel in such a state of mind. An uneasy, melancholy, and yet pleasing sensation stole over me, accompanied with a passionate longing for the rest of my letters; for though I do enjoy, in a measure, the luxury of hearing from home, yet there is no intelligence yet from my near relations and friends. It is singular, that seldom as *the Post* goes and arrives in this uninhabited and remote land, I should still have heard from England within five hours of sending off my letters to that country. Till two hours

after midnight I sat poring over these letters, as if repeated readings could extract an additional, or a different, sense from them; and when I did lie down, little as I had slept lately, I never closed my weary eyes. The next day found me considerably indisposed, and the intense heat confining me to the tent, I employed myself in repairing my shoes, and shifting the papers of my plants.

Up to Wednesday, the 14th, I remained here, chiefly employed in making short trips along the banks of the river, which was rendered so rough by a stormy Westerly wind, that no canoe could go upon it, even to fish. Thus, no salmon having been caught for three or four days, I had nothing but a little boiled horse-flesh to eat, and was glad to eke out this scanty fare with a roasted *Arctomys*,[1] or *Ground-Rat,* a creature common in this country, where it burrows in the sand under bushes, and lives on the fruit of *Purshia tridentata,* and the leaves of several species of *Artemisia.* I found the flesh somewhat rancid, or rather of a musky flavour, probably from the bitter strong-scented plants on which it feeds. The Indians of the Walla-wallah and Kyemūse tribes call this animal *Limia.*

Thursday, June 15th.—At four A. M. set off for a walk on some rocky grounds, near the river, having breakfasted on the same food as I had had for some previous days, but long before noon felt greatly exhausted, being unable to get so much as a drink of water. My eyes began also to distress me exceedingly; the sand which blows into them, with the reflection of the sun from the ground, which in many places is quite bare, have made them so sore and inflamed that I can hardly distinguish clearly any object at twelve yards distance.

Friday, 16th.—The weather being pleasant, I began preparing for my great excursion to the mountains, and sent accordingly to the Indian camp, to bid my guide be ready at sun-rise. During the night I was annoyed by the visit of a herd of rats, which devoured every particle of seed I had collected, eat clean through a bundle of dried plants, and carried off my soap-brush and razor! As one was taking away my ink-stand, which I had been using shortly before, and which lay close to my pillow, I raised my gun, which, with my faithful dog, always is placed under my blanket by my side, with the muzzle to my feet, and hastily gave him the contents. When I saw how large and strong a creature this rat was, I ceased to wonder at the exploits of the herd in depriving me of my property. The body and tail together measured a foot and a-half; the back is brown, the belly white; while the tail and enormous ears are each three-quarters of an inch long, with whiskers three inches in length, and jet black. Unfortunately the specimen was spoiled by the size of the shot, which, in my haste to secure the animal, and recover my ink-stand, I did not take time to change; but a female of the same sort venturing to return some hours after, I handed it a smaller shot, which did not destroy the skin. It was in all respects like the other, except being a little smaller. I am informed that these rats abound in the Rocky Mountains, particularly to the north, near the Mackenzie and Peace Rivers, where, during the winter, they destroy almost every thing that comes in their way.

On Saturday, the 17th, my guide did not arrive from the camp until eight A. M., and I was uncertain whether he would come at all. The horses were not brought from the meadow, nor the provisions put up. Considerable time was lost in explaining to the man the nature of my journey, which was thus effected. I told it to Mr. Black, in English, and he translated it in French to his Canadian interpreter, who again communicated it to the Indian in the language of the Kyemūse tribe, to which the latter belongs. As a proof of the fickle disposition and keenness at making a bargain of these people, he no sooner had ascertained the proposed route, and his future remuneration, than he began starting difficulties, in preface to a list of presents wants, among which were food for

[1] *A trachyurus.*

his family, who had been starving, as he assured us, for two months, owing to the failure of the salmon fishery; then shoes for himself, and as his leggings were much worn, leather for new ones. Then followed a request for a scalping-knife, a piece of tobacco, and a stripe of red cloth for an ornamental cap. This bargain occupied two hours, and was sealed by volumes of smoke from a large stone pipe.

Mr. Black offered kindly to send a boy, twelve years old, called the *Young Wasp*, the son of his own interpreter, with me, who, understanding a little of French, might communicate my wishes to the guide, a proposal which I thankfully accepted; but, some days after, I had reason to fear the young rascal told the Indian the very reverse of what I bade him, for after we had, with great difficulty, gained the summit of the snowy mountains, after many days of severe labour, from Saturday the 17th to Wednesday the 21st, when I proposed to descend on the other side, my guide made serious objections to accompany me. All I could suggest, through the medium of the boy, to remove his fears, seemed only to increase them: he assured me that the Snake Indians, with whom his tribe was at war, would steal our horses, and probably kill us; and as it was impossible either to force him to accompany me, or to find my way alone, I was reluctantly compelled for the present to give up the idea of proceeding in that direction.

I had not been long on the much desired summit of this mountain, which is at least nine thousand feet above the level of the sea, and seven thousand five hundred feet above the platform of the mountainous country around, and the snows of which had certainly never been pressed by an European foot before, than my view of the surrounding scenery was closed by the sudden descent of a heavy black cloud, which presently broke in thunder, lightning, hail, and wind. The heavens seemed as on fire with the glare, and the thunder echoed from the other peaks, accompanied with gusts of furious wind, which broke many of the stunted Pines, and unmercifully pelted me with the cutting hail. Glad was I to leave this summit which I had so much longed to gain, and to descend to my camp ere night arrived. I was much refreshed during my weary walk, which the want of snow-shoes rendered, on the high parts, much more fatiguing, by eating the berries of *Ribes aureum*, which I found in great quantities, and of exquisite flavour, both yellow and black, the former most common, and the size of common currants. As I observe that this shrub only produces its fruit when growing in very dry sandy places; never where the soil is rich, and very sparingly, if it is at all moist; it would be worth the while of cultivators at home to attend to this circumstance. As I had tasted nothing but these berries all day, I found a small basin of cold tea at night, with some dried salmon, particularly refreshing.

The storm continued unabated, by which my poor horses were so alarmed that it was necessary to tie them to some trees close to our camp; but the chief disadvantage arose from its being impracticable to keep a fire lighted, and, as I was afraid to lie down cold in my soaked clothes, I stripped, and rolling myself in my blanket, soon fell asleep, but woke about midnight, so benumbed with cold, that I found my knees refuse to do their office. Having rubbed my limbs most vehemently with a very rough cloth, to restore animation, I succeeded at last in making a little fire, when some hot tea did me more good than any thing else could have done. If ever, however, my zeal has been damped, it was on this occasion; my guide too, and interpreter, were so much disheartened by the difficulties of the way, the dreadful storm, and the want of provisions, that I finally consented to return, and regained the Columbia on the night of Saturday, the 24th, after an absence of nine days, during which time I had not seen a human face, save those of my two companions. I was, however, fully determined to resume my journey in this direction without much delay, the ground appearing very rich in objects of interest,

among which, that which had gratified me most, was a beautiful *Pæonia* (*P. Brownii*, the only individual of this genus in America), with a flower that is dark purple outside, and yellow within, blooming on the very confines of perpetual snow, while it grows poor and small on the temperate parts of the mountains, and wholly disappears on the plains below. A lovely *Lupine*, (*L. Sabini*, *Bot. Reg. t.* 1485) with large spikes, twelve to eighteen inches long, of yellow flowers, covering whole tracts of the country for miles, and reminding me of the "bonny broom," that enlivens the moors of my native land, gave me much pleasure. The specimens in my collection will show how desirable an acquisition this would be to our gardens. The crevices of the rocks were adorned in many places with a white-flowered *Pedicularis*, and a new *Draba*, while several species of *Pentstemon* fringed the mountain rivulets, and a yellow *Eriogonum* (*E. sphærocephalum*) sprang up in the crevices of granite rocks. Of *Lupinaster macrocephalus*[1] (Pursh), which never grows below three thousand feet on the mountains, I am most anxious to obtain seeds; aslo of *Trifolium altissimum* (Hook. Fl. Bor. Am. v. 1. t. 48.)

Monday, 26th.—Being more and more anxious of making a second journey to the same mountains, I sent again to my guide, and bade him prepare to accompany me; on which he instantly began to plead that he had not recovered from the fatigue of his former excursion, and finally refused to go. Perceiving that this statement was by no means true, at least to the extent that he wanted to make me believe, I was on the point of trying the effect of a little personal chastisement, in order to teach him, that since I was paying for his services I had a right to require them, when he made his escape without loss of time. I afterwards learned that the "Young Wasp," as the interpreter's son was called, had told the poor ignorant being that I was a great *Medicine Man*, which, among these poor people, is considered equivalent to possessing necromantic powers, and having intercourse with evil spirits. Also that if he accompanied me, and acted so as, in any way, to incur my displeasure, I should transform him into a Grisly Bear, and set him to run in the woods for the rest of his life, so that he would never see his wife again. It is not to be wondered at that these fears acted powerfully upon the Indian, and caused him to behave in the way he did.

Mr. Black afterwards furnished me with another guide, whom I took the more readily, as he was no smoker, and such a knave that nobody would dare to steal from him. It is, however, worthy of notice, that among these people confidence answers best. An instance of dishonesty has hardly been ever known where property has been intrusted to their hands. Another good point in their character is hospitality. A stranger can hardly imagine the kindness he will receive at their hands. If they have a hut they entreat you to enter it, or failing that, if the day is wet, one of brushwood is quickly made for your use, and whatever they possess in the way of food is set before you. On one occasion I was regaled with steaks, and a roasted shoulder cut from a Doe, of the Long-Tailed Deer (*Cervus leucurus*), accompanied by an infusion of ——[2] sweetened with a small portion of sugar. The meat was laid on the clean foliage of *Gualtheria Shallon*, in lieu of a plate, and our tea was served in a large wooden dish, hewn out of a piece of solid timber. For spoons we had the horns of the *Mountain Sheep*, or *Mouton Gris* of the Voyageurs, formerly mentioned.

The garb of the Umptqua tribe of Indians, of whom *Centrenose* (a native name) is the Chief, consists of a shirt and trousers, made of the undressed skins of small deer. The richer individuals decorate this garb with shells, principally marine ones, thus showing their proximity to the sea. The females wear a petticoat made of the tissue of *Thuja occidentalis*, like that which is used by the Chenook Indians, and above

[1] *Trifolium megacephalum.*

[2] The word is quite unintelligible in Mr. Douglas Journal.

it a kind of gown of dressed leather, like the shirts of the men, but with wider sleeves. The children fled from me with indescribable fear, and, till assured of my amicable intentions, only one man and one woman could be seen, to whom I gave a few beads, brass rings, and a pipe of tobacco.

Arrangements having finally been made, I set off, and, in three days, reached the snowy mountains, where I was on the whole disappointed, finding little that was different from what I had seen a fortnight before; and, after suffering severely from pain in my eyes, which rendered reading or writing very difficult, except in the morning, and haunted continually by the thought that our people, who were daily expected from the coast, would have arrived and brought my letters, I returned to my camp on the Walla-wallah on Monday, the 3rd of July, and spent the rest of that week in botanizing in the neighbourhood and packing my seeds, for which I had to make a box, and drying and securing my plants.

On the following Sunday, the 9th, an opportunity having offered of sending to the coast, I wrote to Mr. Sabine, giving a short account of my proceedings since I had last addressed him, exactly a month previously; but as this letter is only a repetition of what my journal has just stated, it is unnecessary to copy it here.

In hopes that by going two or three days' journey down the river, instead of prosecuting my researches for plants, in an opposite direction, I might meet the party who are expected from the coast, and thus earlier obtain possession of my much desired letters, I embarked at 10 A. M. of Monday, the 10th; and, the river being at its height, proceeded for two or three hours at the rate of twelve miles an hour, when the great swell obliged us to put on shore. And as the same cause rendered it impossible to fish for salmon, a horse was killed, on whose flesh, with a draught of water, I made my supper. After a cheerless night, during which the mosquitos were excessively troublesome, I proceeded about fifty miles the next day, when I breakfasted on similar fare. While doing this, an Indian, who stood by my side, managed to steal my knife, which had been further secured by a string tied to my jacket; and as it was the only one I possessed, for all purposes, I offered a reward of tobacco to get it returned. This bribe being ineffectual, I commenced a search for its recovery, and found it concealed under the belt of one of the knaves. When detected, he claimed to be paid the recompence; but as I did not conceive him entitled to this, as he had not given it at first (nor *given* it at all indeed), I paid him certainly, and so handsomely, with my fists, that I will engage he does not forget the *Man of Grass* in a hurry. Having halted at night below the Great Falls of the Columbia, I saw smoke rising behind some rocks, and, thinking it might be Indians fishing, walked thither in quest of salmon. Instead of their savage countenances I found, however, to my great delight, that it was the camp of the brigade from the sea. I cannot describe the feeling which seizes me, when, after travelling some weeks together with Indians, I meet a person whom I have known before; or if even they are strangers, yet the countenance of a Christian is at such times most delightful. In the present instance I had the additional happiness of finding myself in the society of those who had ever treated me with cordiality, and who now seemed to vie with one another in acts of kindness towards me. Observing my dejected and travel-worn plight, one fetched me some water to wash with, another handed me a clean shirt, and a third busied himself in making ready something more palatable than carrion, for my supper; while my old friends, Messrs. M'Donald and Wark, handed me those best of cordials, my letters from England! Two of these, from Mr. Sabine and my brother, were peculiarly gratifying. Those persons who have never been, like me, in such a remote corner of the globe, may perhaps think I should be ashamed to own my weakness on the present occasion; but

long as I had been kept in ignorance of every thing respecting my dearest friends, my anxiety was not allayed by *one* perusal of my letters, and no less than four times during the night did I rise from my mat to read and re-read them, till, ere morning dawned, I had them, I am sure, all by heart. The first thing I did, after this sleepless night, was to write a few lines of acknowledgment to Mr. Sabine, and by sun-rise I was again seated in the boat, on my return up the river, and with new spirits resumed my employment of botanizing during the frequent portages that we made, previous to arriving at Walla-wallah on Saturday. Thence, on Monday, the 17th, I accompanied Messrs. Wark and M'Donald, who were going by water, with a party of twenty-eight men, to the Forks of Lewis and Clarke's River, about one hundred and fifty miles from the Columbia, and as the marches these gentlemen proposed to make would be short, I hoped to obtain most of the plants which grow on the banks of this stream.

Tuesday 18th to Monday 24th.—Lewis and Clarke's River is a stream of considerable magnitude, in many places from two hundred and fifty to three hundred yards broad, very deep and rapid: its general course is easterly. At twenty-five miles from its junction with the Columbia, the country near its banks changes from undulating and barren to lofty rugged mountains, and not a blade of grass can be seen, except in the vallies and near springs, where a little vegetation survives the intense heat. We rose always at day-break, and camped at three or four P.M., during which interval the thermometer, commonly standing in the shade at 108° of Fahrenheit, it was dangerous to attempt travelling, unsheltered as we were by any screen from the scorching sun. In the cool of the evening we generally made fifteen or twenty miles more. Except that good water may always be obtained, there is nothing to render this country superior, in summer, to the burning deserts of Arabia. Salmon are caught in the river, and sometimes in great numbers, but they are neither so plentiful nor so good as in the Columbia; we obtained occasionally a few from the Indians, to vary our standing dish of horse-flesh, boiled, or roasted at the end of a stick; but such is the indolence of these people that they will almost rather starve than incur much labour in fishing. I found great relief from the burning heat by bathing every morning and evening, and, though the practice is certainly enfeebling, yet I doubt if I could at all have prosecuted my journey without it.

Monday, 24th.—Arrived at the Forks of the river at dusk, where we found a camp of three different nations, upwards of six hundred men, able to bear arms: these were the Pierced Nose Indians, the Chawhaptan and the Chamniemucks. The chiefs, or principal men of each tribe came and staid with us till late, when they presented us with some favourite horses.

Tuesday, 25th.—Understanding from my companions that their stay here would be for a few days, I was desirous of making a trip to the mountains, distant about sixty miles, and part of the same ridge which I had visited, in a part much to the South-East, during spring. As, however, no arrangement had yet been made with the natives, it was deemed imprudent for me to venture any distance from the camp; but, on Wednesday a conference being held, which terminated amicably, and with all the pomp and circumstance of singing, dancing, haranguing, and smoking, the whole party being dressed in their best garments, I took advantage of the conclusion of this novel and striking spectacle, to beg the services of one of Mr. M'Donald's men, named *Coq de Lard*, and with him to start on an exploring trip, in the direction of the said mountains. My companion and friend, (guide he could not be called, as he was equally a stranger to this country as myself,) travelled two days, when we reached the first ridge of hills. Here we parted, I leaving him to take care of the horses, and proceeding alone to the summit, where I found nothing different, as to vegetation, from what I had seen before, but was much struck with a remarkable spring that rises

on the summit, from a circular hollow in the earth, eleven feet in diameter: the water springs up to from nine inches to three feet and a half above the surface, gushing up and falling in sudden jets; thence it flows in a stream down the mountain fifteen feet broad and two and a half feet deep, running with great rapidity, with a descent of a foot and a half in ten, and finally disappears in a small marsh. I could find no bottom to the spring at a depth of sixty feet. Surrounding this spring, which I named Munro's Fountain, is a beautiful thicket of a species of *Ribes*, growing twelve to fifteen feet high, and bearing fine fruit, much like gooseberries, as large as a musket-ball, and of delicate and superior flavour. I hope it may be allowed to bear the specific name of *R. Munroi* (*Bot. Reg. t.* 1300). The *Pæonia* (*P. Brownii*), mentioned before, with *Abronia vespertina*, and a fine *Xylosteum* and *Ribes viscosissimum*, also grew here. On joining my guide we examined the state of our larder, and finding that provisions were low, and our appetites keen, we determined to regain our friends' camp, and, travelling all night, arrived there at sun-rise. Hardly, however, had I lain down to sleep, than I was roused by the call to arms, which, to a *Man of Grass* and of *Peace*, is far from welcome. A misunderstanding having arisen between our interpreter and one of the Indian chiefs, the latter accused the former of not translating correctly, and words failing to express sufficiently his wrath, he seized the poor man of language, and tore off a handful of his long jet hair by the roots. On being remonstrated with for this violence, the Indian set off in a rage, and summoned his followers, seventy-three in party, who came all armed, each with his gun cocked, and the arrow on the bow-string. As, however, every individual of our camp had done all that was possible to accommodate matters, we took things coolly, and apparently careless of the result, stood, thirty-one in number, to our arms, and asked if they wished for war? They said "No; we only want the interpreter to kill him, and, as he is no chief, this could not signify to us." But our reply was, that whether chief or not, each individual in our camp, though he were only an Indian, was entitled to our protection; and if they offered to molest him, they should see whether we had ever been in war before or not. The coolness which we took care to show by our countenances as much as in our speech, had the desired effect, and they earnestly begged for the peace which we were certainly quite as glad to grant. Many speeches were made on the occasion, and, to judge by the gestures of these children of nature, and the effect which their harangues produce, some of them must possess oratorical powers of no mean description. The affair ended, as usual, by an interchange of presents. Still, though friendship was restored, it would have been highly imprudent to venture myself away from the camp, and I spent the time, till the 31st of July, in arranging and securing what I had already collected, when I parted with Mr. M'Donald, who descended the Columbia, and accompanying Mr. Wark and two men, departed overland in a North-Easterly direction, towards Kettle Falls, on the Columbia, and reached the Spokan River on Thursday, the 3rd of August, where I was kindly welcomed at the old establishment by my former host, Mr. Finlay. The next day I left him for the Columbia, and came to a favourite fishing-place of the Indians, who were busily engaged in snaring salmon, in traps made of basket-work, and shaped like funnels. Here they had already caught one thousand seven hundred fish in one morning, having speared and thrown on shore that number, while many more remained within the snare, awaiting their fate. The spear is pointed with bone, laced tight to a pointed piece of wood, which again is frequently fastened to a long staff with a cord. During the best part of the fishing season, from one thousand five hundred to two thousand salmon are caught on an average in the day. Again, as in the spring, I had to cross Barrière River, by swimming; and on Cedar River, a small but rapid stream.

that flows about nine miles farther into the Columbia, had a narrow escape from losing my horse, and receiving a severe hurt. The animal stuck in the bank, which is very steep and slippery, after crossing, and, in his struggles to get free, gave me a sharp blow, and threw me head foremost into the river; the force with which the poor beast did this, enabled him however to extricate himself from what he probably felt would otherwise have proved his grave, and I received no other injury than a terrible ducking, from the effects of which a walk of several miles enabled me to recover, with the loss, however, of all the seeds I had been collecting during this trip, and of my knapsack and note-book. After an absence of two months I was kindly re-welcomed to the Kettle Falls, by Mr. Dease, on the evening of Saturday, the 5th August. Several species of *Œnothera, Trifolium, Artemisia,* and a novel *Eriogonum* were added to my stores.

August 7th to Tuesday 15th.—Continued collecting seeds, drying and packing plants; but learning from Mr. M'Loughlin that the vessel at Fort Vancouver would not sail for England until the 1st of September, and that it is the last which will probably proceed thither direct for some years, and, as I have a collection of seeds ready to go, amounting to one hundred and twenty species gleaned this year, I am very desirous of sending every thing that I can muster by her. By some means or other I must endeavour to reach the ocean, carrying my collections to be despatched homeward. I therefore packed up a share of my paper and seeds, with what little linen I could spare, intending to leave the box at this place, whence it will be forwarded across the Rocky Mountains to Fort Edmonton, where I hope to find it early in June. Mr. Dease kindly took the trouble of speaking to the *Little Wolf,* a chief of the Oakanagan tribe of Indians, to conduct me to Oakanagan, as the Columbia is now so full of rapids, cascades, and whirlpools, that I could not proceed by a canoe, unless I had six or eight men to manage it; nor is there, indeed, any boat here large enough for the purpose.

17th.—Packed a bundle of dry plants in my trunk, among my little stock of clothing, consisting of a single shirt, one pair of stockings, a night-cap, and a pair of old mitts, together with an Indian bag, of curious workmanship, made of Indian Hemp, a species of *Apocynum, Helonias tenax* and Eagle's quills, used for carrying roots and other such articles. A party of twenty-one men and two females arrived belonging to the Cootanie tribe, whose lands lie near the source of the Columbia, for the purpose of fishing. Between these and the tribes on the Columbia lakes, about sixty miles above this place, who are now similarly engaged at the Falls, an old quarrel exists, which causes much uneasiness to Mr. Dease and all our people. The parties met to-day stark naked, at our camp, painted some red, some black, others white and yellow, all with their bows strung, while those who had guns and ammunition, brought their weapons charged and cocked. War caps, made of the Calumet-Eagle's feathers, were the only particle of clothing they had on. Just as one of these savages was discharging an arrow from his bow, aimed at a chief of the other party, Mr. Dease hit him such a blow on the nose as stunned him, and the arrow fortunately only grazed the skin of his adversary, passing along the rib opposite to his heart without doing him much injury. The whole day was spent in clamour and haranguing, and unable to foresee what the issue might be, we were prepared for the worst. Mr. Dease, however, succeeded in persuading them to make arrangements for peace, and begged this might be done without delay on the morrow, representing to them how little they had ever gained by their former wars, in which they had mutually butchered one another like dogs. Unluckily for me, my guide, *the Wolf,* is equally wanted by his party, whether to make war or peace, therefore I am obliged to wait for him.

Friday, 18th.—Bustle and uproar, terminating towards evening in a proposal

of peace the next day; and as this must be sealed by a feast, *the Wolf* cannot be expected to stir till it is over. Mr. Dease, however, has kindly spoken to an Indian, who is in the habit of going journies for him, to guide me, as my time is becoming short, and I hope to start to-morrow early.

Saturday, 19th.—Set off this morning, carrying only as provision a little dried meat, tea and sugar, and a small tin pot. My gun being unluckily out of order, Mr. Wark kindly lent me a double barrelled rifle pistol, and perhaps, going alone and unprotected, it is best to carry nothing that can tempt these savages. Being ill off for clothing, Mr. Dease gave me a pair of leather trousers, made of Deer-skin, and a few pairs of shoes, which were highly acceptable; he also provided me with three of his best horses—one to carry my luggage, one for my guide, and the other for myself. A single shirt and a blanket were all that I carried, more than was on my back, and thus equipped, I set out for Oakanagan, distant two hundred and fifty miles North-West of this place. It was very reluctantly that I allowed myself to be dissuaded from venturing by water. I however hoped somewhat to shorten the journey, by cutting off the angle between the Columbia and Spokan River, especially as the path was throughout likely to be very mountainous and rugged. The heat being extreme, and the night beautifully clear moon-light, I travelled rather more by night than by day, starting generally at two A. M., and stopping to rest and lie down for a few hours about noon-day. Unfortunately my guide and I could not hold converse, neither knowing a syllable of the other's language.

On the second day I arrived at some Indian lodges, just where I wanted to cross the Spokan River, and the people, who were fishing, assisted me in getting the horses over, and carried me and all my property to the other side, in a canoe, for which I rewarded them with a little tobacco. The country was almost invariably a trackless waste, with scarcely a particle of herbage remaining on the gravelly and sandy soil. My meals generally consisted of dried salmon and a little tea, which I boiled, and then sucked the infusion from the leaves; but for three days after passing the Spokan, I was much distressed by the want of drinkable water. Stagnant pools, often so impregnated with sulphur, that not even the thirsty horses would touch it, were all that we could find; and when we did arrive at a tolerable spring, not a twig could be collected for fuel,—and I vainly attempted to boil my little pan with grass, the stems of a large species of *Triticum*. Glad should I have been of the shelter of a tent; but, though I carried one, the fatigue of pitching it, under such a burning sun, was more than I could encounter; and when the water proved such as I could not use, I took nothing, thirst being much more frequent with me, at this time, than hunger. During this journey I passed by the stony chasm, which was once the bed of the Columbia River, a truly wonderful spot, in some places eight or nine miles broad, and exhibiting such rocks in the channel as must have occasioned prodigiously grand cascades, with banks of perpendicular height, rising to one thousand five hundred and one thousand eight hundred feet:—in other places perfectly level, and diversified with what must have been fine islands. The rock every where appeared volcanic, and I picked up several pieces of vitrified lava. Two hundred miles, I am informed, does this deserted and dry bed extend, communicating with the present channel of the Columbia, at the Stony Islands, making a circular sweep of a degree and a half South, which is cut off by the straighter line of the river's present course. The plants peculiar to the rocky shores of the Columbia are to be seen here and in no intervening place. Here and there was a thick sward of grass, which proved most acceptable to our weary beasts; for the springs were all so bitter and impregnated with sulphur (another symptom of volcanic agency), that it was

seldom they would drink, and the haste with which they hurried to a small pool of better water was near proving fatal to one, for he stuck there so firmly that my guide and I (enfeebled by fatigue) were too weak to extricate him, and I had loaded my pistol to put an end to his misery and struggles, when the guide, in a fit of ill-temper, struck the creature so severely on the nose that he reared, and the point of my pen-knife, with which, as a last hope, I goaded his side, induced him to make such a desperate bound as delivered him from the difficulty.

Wednesday, 23rd. — Last night was dreadfully hot, and the whole heavens in a blaze with sheet lightning. Parched like a cinder with heat and thirst, I lay down and passed a few miserable hours in vainly trying to obtain some sleep. Happily the road was less rugged, and at mid-day I found myself on the banks of the Columbia, opposite the Oakanagan establishment, where an old man, who was spearing salmon, helped us to cross the horses, and put me and my guide over in a small canoe. Here I found my kind friends, Messrs. M'Donald and Ermetinger, who supplied me with a change of linen and some comfortable food. Gladly would I have tarried here two or three days to rest and recruit myself, but my time was too precious; and having communicated to these gentlemen my desire to push on immediately for the coast, that I might put my collections on board the ship which was to sail so shortly for England, they kindly made arrangements with some Indians to conduct me to the junction of Lewis' and Clarke's River. Meanwhile I wrote a few lines to Mr. Dease, and sent them by the return of my guide, who had behaved entirely well, and who is to stay here two or three days to rest himself, and having picked up a few seeds, and changed my plant-papers, I went early to bed; but the doors being left open, on account of the heat, and the windows, which are made of parchment instead of glass, not closing tightly, the mosquitoes found free access. Thus I was under the necessity of abandoning the house, and betook myself to a sort of gallery over the gate, where I obtained some sound sleep.

Before leaving this place next morning I took breakfast, and thankfully accepted a little tea and sugar, which, with a small portion of dried salmon, was all that my kind friends had to give. The stock of dried meat that I had received from Mr. Dease was not, however, quite exhausted, so that I considered myself pretty well off, particularly when they kindly added a little tin shaving pot, the only cooking utensil they could spare. Two miles and a half from this place a disaster deprived me of these gifts; in passing the canoe down a rapid, I took the precaution to lift out my paper, plants, seeds, and blanket, and was carrying these along the shore, when a surge struck the canoe in the middle of the rapid, and swept every article out of it except the dried meat, which had fortunately got wedged into the narrow place at the bottom. The loss of the tea and sugar, and the pot, was a great one in my present situation, but still I deemed myself happy in having saved the papers and seeds, though my collection of insects and my pistol were also gone. As I have described the appearance of this part of the Columbia on my ascent, I shall say but little of my return. The passage of the Stony Islands, which is considered a dangerous place, was facilitated by hiring an Indian, who lived close by, and was better acquainted with this narrow channel (only twenty to thirty feet wide, and excessively rapid) than my guide, and who thought himself well paid with a few crumbs of tobacco, and a smoke out of my own pipe. Two days after, having quitted the canoe, near the Priest's Rapid, and walked several miles along the shore, while my two Indians should accomplish this difficult piece of navigation, I waited some time for their arrival, and feeling alarmed for their safety, returned a good way to look for them, when I found them comfortably seated on the shore, under a small cove, and treating their friends to a share of the tobacco I had given them. At Walla-wallah, I

was too weak and reduced to partake of the fare which Mr. Black, the person in charge, kindly set before me, but only begging him to procure me a guide to convey me to the Great Falls, lay down on a heap of fire-wood, to be free from Mosquitoes, and slept till morning. I paid my former guide with ten charges of ammunition, and gave him some tobacco (that universal currency) to buy his provision on the way home; then taking a larger canoe, and two guides, set off on the morning of Saturday, the 26th, for Fort Vancouver. I had the good fortune to purchase a fresh salmon, from a party of Indians, soon after leaving Walla-wallah, and my acquaintance with the channel enabled me to drift securely at night over a part of the river, where the Indians of some neighbouring lodges are in the habit of stopping and pillaging the boats which pass. The next day I arrived at the Great Falls, where I found from five hundred to seven hundred Indians, but was sorry to learn that the Chief, *Pawquanawaha*, who had been my last guide to the sea, was not at home; but as I am now *en pays de connaissance*, and can speak the language tolerably well, I easily procured two others, one of whom I knew before. The *Chiefess* refreshed me with nuts and whortleberries, and I proceeded fifteen miles, where I camped for the night. A large party of seventy-three men came to smoke with me, and all seemed to behave decently, till I found that my tobacco-box was gone; having been taken from the pocket of my jacket, which I had hung up to dry, being drenched in the canoe while descending the Falls. As soon as I discovered my loss I perched myself on a rock, and, in their own tongue, gave the Indians a furious reprimand, applying to them all the epithets of abuse which I had often heard them bestow on another; and reminding them that though they saw me only a *Blanket Man*, I was more than that, I was *the Grass Man*, and therefore not at all afraid of them. I could not, however, recover my box, but slept unmolested after all the bustle. On Tuesday, the 29th, I reached the Grand Rapids, but found the river so rough, from a high wind which raised the water in great waves, that I was obliged to halt, and betook myself to the lodge of *Chamtalia*, my old guide, who set before me a hearty meal of whortleberries and fresh salmon. He then spoke of accompanying me in a larger canoe, and two Indians, to the sea; but seeing that the kind fellow was busily employed at this time in curing his salmon, I refused his services, and hired his brother and nephew instead. I hastened on, lest the wind, which had been rising for some days, should increase so as to delay my progress, and, by great exertion and starting before day-light, accomplished the desired object: and at noon of the last day of August, the day previous to that (the 1st of September) on which the ship was fixed to sail, landed at Point Vancouver, whence in poor plight, weary and travel-soiled, glad at heart, though possessing nothing but a shirt, leather trousers, and old hat, having lost my jacket, neck-kerchief, and worn out my shoes, I made my way to the Fort, having traversed eight hundred miles of the Columbia valley in twelve days, unattended by a single person, except my Indian guides.

EXCURSION TO NORTH CALIFORNIA AND THE UMPTQUA OR ARGUILAR RIVER, &c. TO PROCURE CONES OF THE GIGANTIC PINE.

September 1st, Friday.—In the morning saw my chests placed in a boat, which was going with cargo to the ship at sea. I had intended to accompany my collections, and see them stowed in the Dryad; but meeting Captain Davidson, who had come to the Fort, to take leave of the gentlemen there, I mentioned my wishes to him, and gladly embraced the opportunity of resting, and writing a few lines to my friends in England.

Saturday 2nd to Friday 15th.—Weather warm and cloudy, with heavy dews at night. Employed myself gleaning a few seeds of the choice plants that I had collected last year, especially *Ribes sanguineum*, *Gualtheria Shallon*, *Acer macro-*

phylla and *circinnata*, *Berberis Aquifolium*, &c.; and laid in specimens of *Pinus taxifolia*, with fine cones. I also obtained a few sections of the various woods, gums, and specimens of the bark of those timber trees which compose the forest in this vicinity. I consulted Mr. M'Loughlin on the practicability of visiting the country south of the Columbia, on the Multnomak and Umptqua rivers. It had been my intention to accompany Jean Baptiste Mackay, one of the hunters, who often visits this district, but he had unfortunately started just previous to my arrival, and knowing nothing of the country myself, I feared it would be impracticable to follow and overtake him. Mr. M'Loughlin, however, informs me that a party will be despatched in a few days in that direction, under the superintendence of Mr. A. R. M'Leod, who has formerly showed me much civility, and that there will be nothing to prevent my joining him. So favourable an opportunity is not to be lost.

Friday, 15th.—Mr. M'Leod set off first, to go by land to M'Kay's abandoned establishment on the Multnomak, fifty-six miles above its junction with the Columbia: there he will remain till the rest of the party arrive, who will go in a few days.

Saturday 16th to Tuesday 19th.—Employed making preparations for my march. As my gun has quite failed me, I am under the necessity of purchasing another, which only costs £2. The country whither we are bound being unexplored, and totally unknown south of the Umptqua or Arguilar River, each individual is obliged to restrict himself to the least possible quantity of incumbrances, especially as land conveyance increases the difficulty. I packed up six quires of paper and a few other small articles, requisite for what I call *my business*, and provided myself with a small copper kettle, and a few trifles, with a little tobacco for presents, and to pay my way on my return. All the personal property I shall carry, except what is on my back, consists of a strong linen shirt and a flannel one; but as heavy rains may be expected near the coast, I indulge myself with two blankets and a tent. Mr. M'Loughlin has most generously and considerately sent forward, to wait for me on the Multnomak River, one of his finest and most powerful horses. It will serve either for riding or carrying my baggage, as may be required.

20th Wednesday.—Left Fort Vancouver in company with Mr. Manson, and a party of twelve men, in a boat containing hunting implements, and arrived on the third day (Friday, the 22nd), at Mr. M'Leod's encampment.

23rd to 27th.—Little progress made, because of our horses having strayed to considerable distances; but I spent my time in botanizing, and found two species of *Rosa*, a new *Ribes*, and some other things. We took our course due West, towards the coast, passing over a pleasant undulating country, with rich soil, and beautiful solitary oaks and pines, scattered here and there. The ground, however, being burned up; not a single blade of grass, except on the margins of rivulets, is to be seen.

28th.—Mr. M'Leod joined us here, and brought an Indian guide from the coast, South of the country inhabited by the Killeemucks. Our hunters were very unfortunate in the chase, and, though nine deer were seen in one groupe, the animals were so shy, and kept so close in the thicket, that no fresh meat could be procured. The next day (Thursday) one was killed by a hunter with his rifle, two hundred yards distant. The ball entered the left shoulder, and passed through the neck on the opposite side, yet the animal ran nearly a quarter of a mile before she fell.

Proceeded in the same kind of way, seeing little worthy of note for two or three days. Deer were scarce, and the custom of burning the soil is highly unfavourable to botanizing. This plan prevails every where, though the natives vary in their accounts of the reason for which it is done, some saying that it is in order to compel the deer to feed in the unburnt spots, where they are easily detected and killed; others, that the object is, to enable

them to find wild honey and grasshoppers, both of which serve for their winter food.

Sunday, October 1. Very heavy dew during the night, but the day clear and pleasant, with generally a refreshing westerly wind. I observed some trees of *Arbutus laurifolia* much larger than I had ever before seen—fifteen inches to two feet in diameter, and thirty to forty-five feet high, with fruit nearly ripe: they seem to thrive best in a deep rich black loam near springs, and on a gravelly bottom. Passed at noon some Indians digging the roots of *Phalangium Quamash*. On such journeys as these, I am sorry to say that Sunday is only known by the men changing their linen, while such as can read, peruse in the evening some religious tract, the tenets of which, generally speaking, are agreeable to the tenets of the church of Rome. In the dusk I saw a very large *Grisly Bear* (*Ursus ferox*), enter a low hummock of brushwood at some little distance, but it was becoming so dark that I thought it better to leave him unmolested; and though I went in search of the animal next morning by daylight, I could find nothing of him.

2nd to the 7th. During this period little occurred worthy of note; we generally walked about twenty miles a-day, and fared scantily, finding the deer very scarce and shy. At noon of this day (7th) we were joined by J. Baptiste Mackay and two Iroquois; he informs me that he has already given one of his hunters who went to the Umptqua or Arguilar River, orders to bring home cones of the large Pine for me. *Pinus resinosa* here attains a height of one hundred and thirty feet, and a diameter of four or five. On one of these trees I killed a beautiful *Grey Squirrel*, measuring two feet from tail to snout, and saw a curious striped variety, and also a flying squirrel, but could not secure either of these. *Typha angustifolia* and *Nymphæa advena* are not uncommon in small lakes. We saw Mount Jefferson of Lewis and Clarke about twenty or thirty miles distant, covered with snow for a considerable part of its height. I bargained with Mackay for the skin of a large female *Grisly Bear*, which he had killed seven days before, and obtained it for a small old blanket and a little tobacco. I mean to use it as an under robe to lie upon, as the cold dew from the grass is very prejudicial to my health. If possible, he will obtain a male of the same kind for me as a match.

One of our hunters, J. Kennedy, had a most narrow escape this morning from a male *Grisly Bear*, which he did not perceive till it had come within a few yards of him. Finding it impossible to out-run the animal, and his rifle missing fire, Kennedy sprang up a small oak which chanced to be near; the bear was so close behind, that he seized him by one paw on the back and the other under the right arm, but fortunately his clothing was so old that it gave way, or he must have perished. Blanket, coat, and trousers were torn almost to rags. This kind of bear cannot climb trees. Our hunters all turned out to seek for the beast, but could not meet with it, though such a supply of food would have been most acceptable. Our last fragments of meat were cooked last night, and gave us a very scanty supper; this morning a small deer enabled us to obtain some breakfast. Thus we live literally from hand to mouth, the hunters all declaring that they never knew the animals of all kinds to be so scarce and shy, which is attributable to the great extent of country that has been burned.

Monday the 9th. A small *Elk* was killed to-day, after receiving eleven shots; it weighed about 500 lbs., but was lean and tough. The horns of this species are very large, thirty-three inches between the tips, with five prongs on each, all inclining forward, the largest three feet all but one inch long; body of an uniform brown, with a black mane four inches long. I am pretty certain that this is the same sort of animal that I have seen at the Duke of Devonshire's, and unquestionably a very distinct species from the European Stag. I ascended a low hill, about two thousand five hundred feet above its platform, the lower part covered with trees of enormous size.

and the same sorts as on the Columbia. On the summit are only low shrubs, small oaks, and a species of *Castanea*. This fine species I first took for a *Shepherdia*, as it was only shrubby in growth, but I shortly found it on the mountains, growing sixty to one hundred feet high, and with a diameter of three to five feet. The leaves of this tree, (*Castanea chrysophylla*) give quite a peculiar and lovely tint to the landscape. The fruit seems extremely rare, as I only saw it on a single tree, and that growing on the very summit of the mountain. Under its shade is a fine evergreen shrub, new to me, apparently a *Clethra*. Here, too, *Pinus resinosa* grows immensely large, two hundred and fifty feet high, and fifty-five feet in circumference. *Arbutus Menziesii* and *laurifolia* are abundant, but their fruit is almost all taken away by the bears. Two species of *Caprifolium*, that I never saw before, grew here. My feet are very sore with walking over the burnt and decayed stumps, and struggling through the thick under-growth of *Pteris Aquilina* and *Rubus suberectus*, which are bound together with several decayed species of *Vicia*.

Friday the 13th to Monday the 16th.—For the last few days our progress has been much retarded by rain and heavy fog. The difficulty of proceeding becomes greater and greater in consequence, for the poor horses slip their footing continually and get bad falls; and to ensure the safety of my collections, I carry them on my back, tied in a Bear's skin. We have passed three ridges of mountains, about two thousand seven hundred feet high, Mr. M'Leod and I taking the lead, and chopping off, with the help of Baptiste M'Kay and two Indians, the branches of trees which impede our progress. The numerous trunks of fallen Pines are of almost incredible size, often measuring two hundred and fifty feet. A tree, apparently belonging to *Myrtaceæ*, struck me much: its leaves, wood, fruit, and bark, are all aromatic, smelling like *Myrtus Pimento*, and producing sneezing like pepper. The fruit is large, globular, and covered with a fine thin green skin, enveloping a small nut with an insipid kernel, which appears to be the favourite food of squirrels. I trust this fine tree will ere long become an inmate of English gardens, and may even be useful in medicine, and afford a perfume. It is *Laurus regia*.

Want of food, and the difficulty of making our way along, renders this journey most exhausting. We were somewhat cheered at seeing the Umptqua River rolling along below us, when we reached the summit of a weary ridge of mountains today. The stock of food being quite done, Mr. M'Leod and M'Kay went out to shoot, while I employed myself in chopping wood, kindling the fire, and fórming our encampment; and after twilight refreshed myself by bathing in the Umptqua. Our distance from the ocean could not exceed thirty or thirty-five miles, as I observed *Menziesia ferruginea* (*Bot. Mag. t.* 1571) and *Pinus Canadensis*, both of which always keep along the skirts of the sea. The poor horses are so fatigued that it is found impracticable to bring them up to-night, and mine being among the laggards, I cannot lie down, as I have nothing whatever to stretch beneath me, my blanket and bearskin being among the luggage on the horse's back. Mr. M'Leod returned unsuccessful, so that we were supperless; but he hopes that a large doe, which though wounded, yet managed to elude his search at night, may still be found to-morrow morning.

Tuesday the 17th. Last night sat by the fire till two o'clock, when Mr. M'Leod most kindly insisted on giving me his own blanket and buffalo robe to lie down upon, while he took a turn of sitting up, wrapped in a great coat. We all three went out to seek for the wounded doe, and found her with a ball that had pierced both shoulders; still, another shot was necessary to despatch her. M'Kay having also brought down a fine buck, weighing 190 lbs., we returned to the camp in high spirits, and made a comfortable meal on the excellent venison these animals afforded. Our horses did not arrive till four o'clock, and in a very exhausted condition. The luggage which

mine carried was almost destroyed by the poor beast's repeated falls; the tin box containing my note-book bruised quite out of shape, its sides bent together—a small case of preserving-powder quite spoiled,—and my only shirt reduced, by the chafing, to the state of surgeon's lint. I congratulated myself exceedingly on not having trusted my papers of plants to the same conveyance, but carried them on my back. The country towards the upper part of the river appears to be more varied and mountainous, and may, perhaps, afford me the much-wished-for *Pine*, as it certainly considerably resembles the spot described to me by the Indian in whose smoking pouch I last year found some of its large scales. If the morning proves fine, and any provision has been killed, I intend to start to-morrow for a few days' excursion in that direction, Baptiste M'Kay having given me one of his Indian hunters, a young man about eighteen years of age, as a guide. To what nation he belongs he does not know, as he was brought from the South by a war party when a child, and kept as a slave till M'Kay took him. He is very fond of this mode of life, and has no desire to return to his Indian relations; and as he speaks a few words of Chenook and understands the Umptqua tongue, I trust to find no difficulty in conversing with this my only companion.

Wednesday the 18th. I set off this morning, proceeding due South, and crossed the river five miles from an encampment of Indians, where there were two lodges and about twenty-five souls, mostly women, the wives of Centrenose, who is chief of the tribe inhabiting the upper part of the Umptqua River. They very courteously brought me a large canoe, in which I embarked, and swam the horses at the stern, holding their bridles in my hand. My guide proving less conversant with the language of the people than I had expected, my intercourse with these Indians was but limited. They gave me nuts of *Corylus*, with the roots of *Quamash*, and a sort of meal prepared from the roots of a Syngenesious plant already in my possession, mixed with the roasted and pulverized nuts of the myrtaceous tree before mentioned. A decoction of the leaves and tender shoots of this tree is by no means an unpalatable beverage.

Soon after a herd of small deer sprang off before me, and I shot a female through the vertebræ, when she instantly dropped. Since leaving Fort Vancouver, I have often seen these creatures run several hundred yards before falling, after a ball has gone through the heart. No fording place appearing here, nor for a considerable distance, I began making a raft, which blistered my hands dreadfully, and proved, after all, too small, so that I closed the day's toil by kindling a fire and roasting some of my venison for supper.

Thursday the 19th. Finding my hands in such a state that I could not proceed with my raft, I wrote a note to Mr. M'Leod, then nine miles distant, informing him of my situation, and sent it by my Indian guide, during whose absence I took my gun and went out to the chase. I soon after wounded a very large buck, but in the eagerness of pursuit, fell into a deep gulley among a quantity of dead wood, and lay there stunned, as I found by my watch when I recovered, nearly five hours, when five Indians of the Callipoosie tribe helped to extricate me. A severe pain in the chest quite disabled me, and I found my only plan was to regain the camp as fast as possible, my Indian friends lending a hand to saddle my horse and assist me to mount it. It gave me more pleasure than I can describe to have some excellent provision left, with which I could recompense these friendly savages for their timely aid. After expressing my gratitude in the best way I could, I endeavoured to creep along with the help of my stick and gun, but was thankful to meet with John Kennedy, whom Mr. M'Leod had kindly despatched to render me assistance, and who accompanied me to the camp, where a little tea considerably revived me. I also bled myself in the left foot, and felt much better. Several deer have been killed since my departure.

Friday the 20th. Much better, only stiff and sore, as if from carrying a heavy load: proceeded slowly about ten miles, but was much fatigued. On Saturday fell in with several Indians, accompanied by their chief, who gave us a large number of very fine Salmon-trout, three feet and a half long, of excellent quality, and taken by the spear, as netting is here unknown.

Sunday the 22nd. Little worthy of note occurred. Our Indian friends brought us more fish, and a very large *Black-tailed Deer* (*Cervus macrotis*) was brought down by Mr. M'Leod's rifle. This is a grand animal, seldom seen further North than 47° N. lat., and one-fifth larger than the *Long White-tailed Deer*. It is often taken by a snare made of a species of *Iris* (*Iris tenax, Bot. Mag. t.* 3343), which, though no thicker than the little finger, is strong enough to secure the largest Buffalo and the Elk. The women of this tribe are all tattooed, chiefly over the lower jaw in lines from ear to ear. This kind of marking is considered a great addition to beauty. I doubt not that such a lady in London, particularly when in her full dress, of red and green earth applied to the upper part of her face, would prove, at least, an object of great attraction.

Mr. M'Leod has been much engaged all day in making arrangements for his journey to the country South of this river, where one large and two small rivers are said to exist. While he is in that quarter, I purpose, if in health, to resume my route towards the head-waters of the Umptqua, where I have no doubt many rarities may yet be found. Centrenose (the principal Chief) came to our camp this afternoon, and with him Mr. M'Leod means to make arrangements for my being accompanied either by him or some of his sons.

Monday the 23rd. Mr. M'Leod has made the desired arrangement, and while Centrenose goes with himself to the coast, one of his sons will accompany me in my researches, which are chiefly directed towards the discovery of the great *Pine* so frequently mentioned. The road being hilly, wooded, and difficult to travel, I declined the use of more horses than were absolutely needful, namely, one for my guide, and the other to carry my blanket and paper, and on which I could occasionally ride. Started at ten, and pursued the same course as I had taken four days ago; the Indians again behaving very civilly, putting me across the river in their canoes. By signs I made them understand my wishes, and they kindled a fire and brought me water, nuts, and roots of *Quamass*, with some fresh *Salmon-trout*, for which I repaid them with deer-flesh and tobacco, beads and rings. A shrubby *Lupine* grew on the banks of the river, nearly four feet high, but I could obtain no perfect specimens.

Tuesday the 24th. My new friends had, during the night, gone to a small Rapid on purpose to spear Trout for me, and woke me this morning long ere daylight, to eat. Proceeded about nine miles near the river, through a district which the thick woods rendered fatiguing, and then climbed over a bare hill, three thousand feet above the level of the sea, and re-entered an almost impenetrable thicket. The rain fell in torrents. I ate the last bit of my deer-flesh, and with difficulty boiled a few ounces of rice; but as I am not sure of meeting with any Indians, so as to obtain fresh supplies, I mean to limit myself, at present, to one meal a-day. Here I observed, climbing over trees, a species of *Vitis*, the only one I have ever seen West of the Rocky Mountains. I made seventeen miles to-day.

Wednesday the 25th. Last night was one of the most dreadful I ever witnessed, the rain, falling in torrents, was accompanied by so much wind as made it impossible to keep in a fire; and to add to my miseries, the tent was blown down about my ears, so that I lay till daylight, rolled in my wet blanket, on *Pteris aquilina*, with the drenched tent piled above me. Sleep was, of course, not to be procured: every few minutes the falling trees came down with a crash which seemed as if the earth was cleaving asunder, while the peals of thunder and vivid flashes of forky lightning

produced such a sensation of terror as had never filled my mind before, for I had at no time experienced a storm under similar circumstances of loneliness and unprotected destitution. Even my poor horses were unable to endure it without craving, as it were, protection from their master, which they did, by cowering close to my side, hanging their heads upon me and neighing. Towards daylight the storm abated, and before sun-rise the weather was clear, though very cold. I could not stir without making a fire and drying some of my clothes, every thing being soaked through; and I indulged myself with a pipe of tobacco, which was all I could afford. At ten o'clock I started, still shivering with cold, though I had rubbed myself so hard with a handkerchief before the fire, that I could no longer endure the pain. Shortly after, I was seized with intense head-ache, pain in the stomach, giddiness, and dimness of sight. All my medicine being reduced to a few grains of calomel, I felt unwilling, without absolute necessity, to take to this last resource, and therefore threw myself into a violent perspiration by strong exercise, and felt somewhat relieved towards evening, before which time I arrived at three lodges of Indians, who gave me some fish. The food was such as I could hardly have eaten, if my destitution were less; still I was thankful for it, especially as the poor people had nothing else to offer me. The night being dry, I camped early, in order to dry the remaining part of my clothing.

Thursday the 25th. Weather dull, cold, and cloudy. When my friends in England are made acquainted with my travels, I fear they will think that I have told them nothing but my miseries. This may be very true; but I now know, as they may do also, if they choose to come here on such an expedition, that the objects of which I am in quest cannot be obtained without labour, anxiety of mind, and no small risk of personal safety, of which latter statement my this day's adventures are an instance. I quitted my camp early in the morning, to survey the neighbouring country, leaving my guide to take charge of the horses until my return in the evening, when I found that he had done as I wished, and in the interval dried some wet paper which I had desired him to put in order. About an hour's walk from my camp, I met an Indian, who on perceiving me, instantly strung his bow, placed on his left arm a sleeve of Raccoon skin, and stood on the defensive. Being quite satisfied that this conduct was prompted by fear, and not by hostile intentions, the poor fellow having probably never seen such a being as myself before, I laid my gun at my feet, on the ground, and waved my hand for him to come to me, which he did slowly and with great caution. I then made him place his bow and quiver of arrows beside my gun, and striking a light, gave him a smoke out of my own pipe, and a present of a few beads. With my pencil I made a rough sketch of the *Cone* and *Pine Tree* which I wanted to obtain, and drew his attention to it, when he instantly pointed with his hand to the hills fifteen or twenty miles distant towards the South; and when I expressed my intention of going thither, cheerfully set about accompanying me. At mid-day I reached my long-wished-for Pines, and lost no time in examining them, and endeavouring to collect specimens and seeds. New and strange things seldom fail to make strong impressions, and are therefore frequently over-rated; so that lest I should never again see my friends in England to inform them verbally of this most beautiful and immensely grand tree, I shall here state the dimensions of the largest I could find among several that had been blown down by the wind. At three feet from the ground its circumference is 57 feet 9 inches; at one hundred and thirty-four feet, 17 feet 5 inches; the extreme length 245 feet. The trunks are uncommonly straight, and the bark remarkably smooth, for such large timber, of a whitish or light-brown colour, and yielding a great quantity of bright amber Gum. The tallest stems are generally unbranched for two-thirds of the height of the tree; the branches rather

pendulous, with cones hanging from their points like sugar-loaves in a grocer's shop. These cones are, however, only seen on the loftiest trees, and the putting myself in possession of three of these (all I could obtain) nearly brought my life to a close. As it was impossible either to climb the tree or hew it down, I endeavoured to knock off the cones by firing at them with ball, when the report of my gun brought eight Indians, all of them painted with red earth, armed with bows, arrows, bone-tipped spears, and flint-knives. They appeared any thing but friendly. I endeavoured to explain to them what I wanted, and they seemed satisfied, and sat down to smoke, but presently I perceived one of them string his bow, and another sharpen his flint-knife with a pair of wooden pincers, and suspend it on the wrist of the right hand. Further testimony of their intentions was unnecessary. To save myself by flight was impossible, so, without hesitation, I stepped back about five paces, cocked my gun, drew one of the pistols out of my belt, and holding it in my left hand and the gun in my right, showed myself determined to fight for my life. As much as possible I endeavoured to preserve my coolness, and thus we stood looking at one another without making any movement or uttering a word for perhaps ten minutes, when one, at last, who seemed the leader, gave a sign that they wished for some tobacco: this I signified that they should have, if they fetched me a quantity of Cones. They went off immediately in search of them, and no sooner were they all out of sight, than I picked up my three Cones and some twigs of the trees, and made the quickest possible retreat, hurrying back to my camp, which I reached before dusk. The Indian who last undertook to be my guide to the trees, I sent off before gaining my encampment, lest he should betray me. How irksome is the darkness of night to one under my present circumstances! I cannot speak a word to my guide, nor have I a book to divert my thoughts, which are continually occupied with the dread lest the hostile Indians should trace me hither, and make an attack; I now write lying on the grass, with my gun cocked beside me, and penning these lines by the light of my *Columbian Candle*, namely an ignited piece of rosiny wood. —To return to the tree which nearly cost me so dear. The wood is remarkably fine-grained and heavy; the leaves short and bright-green, inserted, five together, in a very short sheath; of my three cones one measures fourteen inches and a half, and the two others are respectively half an inch and an inch shorter, all full of fine seed. A little before this time of year the Indians gather the cones and roast them on the embers, then quarter them and shake out the seeds, which are afterwards thoroughly dried and pounded into a sort of flour, or else eaten whole.

Friday the 27th. My last guide went out at midnight in search of trout, and brought me home a small one, which served for breakfast. Two hours before daylight he rushed in with great marks of terror, uttering a shriek which made me spring to my feet, as I concluded that my enemies of yesterday had tracked out my retreat. He, however, gave me to understand, by gesture, that he had been attacked by a Grisly Bear. I signed to him to wait till daylight, when I would go out and look for and perhaps kill the creature. A little before sun-rise Bruin had the boldness to pay us a visit, accompanied by two cubs, one of last year's brood and one of this; but as I could not, consistently with safety, receive these guests before daylight, I had all my articles deposited in the saddle-bags, and driven upon one horse to a mile distant from the camp, when I returned, mounted on the animal Mr. M'Loughlin had given me, and which stands fire remarkably well, and found the bear and her two young ones feeding on acorns under the shade of a large oak. I allowed the horse to walk to within twenty yards, when all three stood up and growled at me. I levelled my gun at the heart of the old one, but as she was protecting her young by keeping them right under her, the shot entered the palate of one of these, coming out at the back of

the head, when it instantly fell. A second shot hit the mother on the chest, as she stood up with the remaining cub under her belly, on which, abandoning it, she fled to an adjoining hummock of wood. The wound must have been mortal, as these animals never leave their cubs until they are themselves on the point of sinking. With the carcase of the young bear, I paid my last guide, who seemed highly to prize the reward, and then abandoned the chase, deeming it only prudent, after what happened yesterday, to retrace my steps towards the camp of my friends. So I returned, crossing the river two miles lower down than formerly, and halted at night in a low point of wood near a small stream.

Saturday and Sunday, the 28th and 29th. Both these days being very rainy, as yesterday also was, and having very little clothing, I made all the exertion in my power to reach Mr. M'Leod's encampment near the sea. It was impossible to keep myself dry, and the poor horses were so fatigued that I was obliged to walk all the way and lead my own by the bridle, the road becoming continually worse and worse from the floods of rain. On Saturday night I halted at my second crossing place, but could procure no food from the Indians, the bad weather having so swollen the river as to prevent their fishing. I boiled the last of my rice for supper, which gave but a scanty meal, and resuming my march the next day, proceeded pretty well, till, reaching the wooded top of the lofty river bank, my jaded horse stumbled, and rolling down, descended the whole depth, over dead wood and large stones, and would infallibly have been dashed to pieces in the river below, had he not been arrested by getting himself wedged fast between two large trees that were lying across one another near the bottom. I hurried down after him, and tying his legs and head close down, to prevent his struggling, cut with my hatchet through one of the trees, and set the poor beast at liberty. I felt a great deal on this occasion, as the horse had been Mr. M'Loughlin's present to me, and was his own favourite animal. Reached the camp at dusk, where I found only Michel La Framboise, our Chenook interpreter, and an Indian boy, who told me that the savages had been very troublesome ever since our brigade of hunters left him some days before. The former kindly assisted me to pitch my tent, and gave me a little weak spirits and water, with a basin of tea, made from some that he had brought from Fort Vancouver, and which greatly refreshed me. Rain very heavy.

Monday the 30th. Last night, about ten o'clock, several Indians were seen round our camp, all armed. Of course, instead of sleeping, we had to watch; we then made a large fire, and leaving the camp, hid ourselves in the grass at a little distance, to watch their movements. An hour and a half before day, a party of fifteen passed near where we were, crawling among the grass towards our fire. We immediately fired blank shot and scared them away; then returned to the camp and breakfasted on some tea and a little dried salmon, and as I had not had a thread of dry clothes upon me for some days, and the rain still continued, I sat within my tent, with a small fire before the door the whole day.

Tuesday the 31st. Heavy showers, accompanied by a North-west wind, blowing off the ocean, which renders the air excessively cold and raw. Brought in wood this morning for fuel, and branches of Pine and *Pteris aquilina* (the *bracken* of my native land) for bedding. At noon an Indian who had undertaken to guide two of the hunters to a small lake, about twenty or thirty miles distant, returned to our camp, wearing one of their coats, and having in his possession some of their hunting implements. All this looks very suspicious: but as we know nothing of his language, and are too few to risk coming to a quarrel, surrounded as we are by foes, we take, at present, no notice, hoping too, that he may only have robbed, and not murdered, our poor countrymen. We continue our watch, and in the anxiety and fatigue, find myself far from well, and very weak. The night, however, passed off quietly.

Nov. 1st, Wednesday. Heavy rain. At

two in the afternoon, Baptiste M'Kay returned from the coast; such bad weather, he says, he never experienced. The tribes, too, are so hostile, that one of the party has been killed, and an Indian woman, wife of one of our hunters, with five children, carried off; what became of them we have never been able to learn. It is a relief to find our little party becoming stronger, and the addition of M'Kay is peculiarly welcome, as he is so good a hunter, that he will soon procure us fresh food.

Thursday the 2nd. Our hopes from M'Kay's prowess are realized, he has brought home a fine doe of the *Long-tailed Deer*, and I gladly turned cook and soon prepared a large kettle-full of excellent venison-soup. Just as we were sitting down to eat, thirteen of our hunters arrived in five canoes, and of course we invited them to partake. This evening has passed much more comfortably than the eleven preceding ones, and although the society may be somewhat uncouth, still the sight of a visage of one's own colour is pleasing, after being so long among Indians. We have all been entertaining one another, in turns, with accounts of our chase and other adventures, and I find that I stand high among them as a workman, and passable as a hunter.

Friday the 3rd. Early this morning made a trip of about twelve miles, in hopes of meeting Mr. M'Leod, who is daily expected. My course lay along the river-banks, which are steep and woody, the stream averaging seven to eight hundred yards wide, with a fall of four feet, owing to the tide, which runs thirty miles up the river from the sea. Collected a fine shrub, with abundant racemes of red juicy berries; also *Vaccinium ovatum* (*Bot. Reg.* t. 1354), loaded with fruit. The former is not eaten, but the latter is pleasantly acid, and much used by the Killiemuck Indians, as is also another species of *Vaccinium*, that I never saw before.

Saturday the 4th. Late last night we were joined by Mr. M'Leod, who has been a good way to the southward. He informs me that this river, the Umptqua or Arguilar, is three-fourths of a mile broad, where it flows into the sea, but that a sand-bar, which crosses the mouth, renders it impassable for shipping. Twenty-three miles further South, is another river of similar size, and affording the same sort of salmon and salmon-trout. At its mouth are numerous bays, and the surrounding country is less mountainous than the North; and twenty miles further still, is yet another river, but smaller than the two preceding, deriving its source, according to the Indians' account, very far up the interior. Here M'Leod's investigation has ceased for the present, as he waits till all his party is collected, before proceeding further. The Indians state, that sixty miles to the southward, where the natives are very numerous, a much larger river, surpassing, as one stated who had seen both streams, the Columbia in size, gains the ocean. The latitude is about 41° North. Mr. M'Leod observed that the vegetation changed materially as he proceeded to the South, the Pines disappearing altogether, and giving place to the myrtaceous tree which I have described, of which he measured several individuals 12 feet round, and 70 to 100 feet high. Its fragrant leaves, when shaken by the least breeze of wind, diffuse a fragrance through the whole grove. All the natives, like those in this neighbourhood, had never seen white men before, and viewed them narrowly, and with great curiosity. They were kind and hospitable in the extreme, assisting to kindle the fire and make the encampment; while they were delighted beyond measure at being paid with a ring, button, bead, or any the smallest trifle of European manufacture. They have the same garments and dwellings as the people here. As Mr. M'Leod tells me that two of his men are going to Fort Vancouver with a despatch on Monday, I mean to accompany them, the weather being such as to prevent my botanizing to any advantage; besides, it is doubtful whether there will be any other opportunity of my returning thither before the beginning of March, when I mean to start for the opposite side of the Continent. Thus I have

made up my mind to return, and can only express the gratitude I feel towards Mr. M'Leod for all the kindness and assistance I have uniformly received from this gentleman.[1]

Tuesday 5th to the 7th. All my goods have been packed for two days, but the heavy rain detains me. As, however, the weather at this season may probably become worse instead of better, I am determined to wait no longer. Started at ten A. M., with John Kennedy, an Irishman, and Fannaux, a Canadian. Mr. M'Leod kindly expressed much regret at seeing me depart with a very slender stock of provision, and that none of the best: a few dried salmon-trout, purchased of the Indians, and a small quantity of Indian corn and rice mixed together, which we had brought from Fort Vancouver; in all, a week's food for three persons. But at this season, I trust there is little to be feared, as we may hope to shoot deer or wild fowl. The late rains rendering the river impassable for loaded horses, we sent our luggage in three small canoes, and camped up the river near the lodges of some Indians, from whom we obtained a small quantity of trout.

Wednesday the 8th. Made little progress, the road being dreadfully bad, and the horses much exhausted with fatigue and poor fare, as there was hardly any grass. Twelve days of extreme misery, during which we travelled with great labour, under all the disadvantages of hunger, cold, and rain, brought me back to the Columbia, where I arrived much disheartened, in consequence of having lost nearly the whole of my collections when crossing the River Sandiam, one of the tributaries of the Multnomak. On reaching the Fort, I had the satisfaction of finding comfortable letters from my friends in England. Here I staid till the 9th of December, when the hope of replacing some of the objects which I had lost, induced me to revisit the coast; but this was a still more unfortunate undertaking than the first, as I had the disaster to be wrecked in my canoe, and returned home sick from the effects of wet and cold, having added nothing to my collection but one new species of *Ledum*, *L. dealbatum*.[2] From this date to the 6th of March I spent my time in the same way as the preceding winter, when I once more visited the sea, and was again driven back by bad weather, having failed for the third and last time. The remainder of my time on the coast was spent in packing up my collections.

DOUGLAS' JOURNEY TO HUDSON'S BAY.

On the 20th of March, 1827, by the annual express, and in company with Dr. M'Loughlin, I started for England from Fort Vancouver, a place where, if I had spent not many comfortable days, yet some such happy ones, that though I hailed the prospect of returning to my native land, I confess that I could not quit such an interesting country without much regret. I walked the whole distance to Fort Cohite, on the Kettle Falls, which occupied twenty-five days, not one of which passed without presenting to my notice something of interest, either in Botany or Zoology. The beautiful *Erythronium grandiflorum* and *Claytonia lanceolata* were in full bloom among the snow.

On the 18th of April Mr. E——, with seven men and myself, took our departure from the Kettle Falls to the Rocky Mountains, early in the morning. Nothing of importance occurred; we entered the Lower Lake on Friday the 20th, and used our sail, the wind being so favourable that we reached the termination of the Upper Lake on Sunday the 22nd. Twenty-eight miles above this place, where the river takes a sudden bend, and to all appearance is lost in the mountains, a scene of the most terrific grandeur presents itself; the whole torrent is confined to the breadth of thirty-five yards, and tossed in rapids, whirlpools, and eddies; on both sides are mountains towering to the height of six or eight thousand

[1] A memorandum in poor Douglas' hand-writing in the margin of his journal at this place is, "Remember, on arriving in London, to get him a good rifle-gun as a present."

[2] No such plant appears in the collection, nor is it described in Mr. Douglas' botanical MSS.

feet from their base, rising with rugged perpendicular precipices from the very bed of the river, covered with dead timber of enormous growth, the roots of which, laid bare by the torrents, and now hurled by the violence of the wind from their original high places, come hurrying down the stream, bringing enormous fragments of earth attached to their roots, and spreading devastation all before them. The sun feebly tipped the mountain-tops as we passed this place, and, seen through the shadowy pines, imparted a melancholy air to the whole gloomy scene.

On the 25th we passed the "Narrows of Death," a terrific place in the river, which takes its name from a tragical circumstance which I have not here room to relate, when ten individuals endured almost unparalleled sufferings, and were finally all released by death, with the exception of one. At noon on the 27th of April, we had the satisfaction of landing at the Boat Encampment at the base of the Rocky Mountains. How familiar soever these snowy mountains have been to us, so that we might be expected to lose an adequate idea of their immense altitude, yet on beholding the Grand "*Dividing Ridge*" of this mighty continent, all that we have seen before seems to fade from the mind, and to be forgotten in the contemplation of their height and indescribably rugged and sharp peaks, with the darkness of the rocks, their glaciers and eternal snows.

The principal branch of the Columbia is here sixty yards wide, the Canoe River forty, and the middle one, on whose banks we ascend, is thirty.

On Saturday the 28th, having packed the whole of my journals in a tin box, and carrying a case of seeds and a shirt or two, tied up in a bundle, we commenced our march across the mountains in an easterly direction, first entering a low swampy piece of ground, about three miles long, knee-deep of water, and covered with rotten ice, through which we sank more than a foot down at every step that we took. Then we crossed a deep muddy creek, and entered a point of wood, principally consisting of *Pine, P. balsamea, nigra, alba,* and *Strobus,* together with *Thuja plicata* About eleven we entered the snow, which was four to seven feet deep, moist and soft, which, together with the fallen timber, made walking in snow shoes very fatiguing. We camped that night on the West side of the middle branch of the Columbia. Except two species of Squirrel, we saw no animals.

Sunday the 29th, min. heat 23°, max. 43°. After a sound and refreshing night's rest, we started at four this morning, proceeding for six miles due East; in the course of which we made as many traverses or fordings of the river, which was two and a half to three feet deep, clear, and with a powerful current. Though the breadth did not exceed twenty-five to fifty yards, the length of time passed in the water was considerable, for the feet cannot with safety be lifted from the bottom, as if once the water gets under the soles of the feet, which should be glided along to prevent this, over goes the whole person. In very powerful currents, it is necessary to pass in a body, and the one supporting the other, in an oblique direction. Then we came to a level valley, three miles broad, dry at this season, but during the summer forming an inland lake, bounded by the mountains. Our course was afterwards due East for four miles, and in this short distance we made seven fordings more. We did not require snow-shoes here, as there was a fine hard solid crust, but on coming out of the water and trotting along on the hoar-frost, we found it intensely cold, and all our clothing that was wet, immediately became cased with ice; still no inconvenience of any consequence was sustained. About nine we entered another point of wood, where we had recourse to our snow-shoes, and finding the snow becoming quite soft towards noon, we camped for the day, having travelled fifteen miles. *Panax horrida* (*Hook. Fl. Bor. Am. t.* 98), a *Dryas,* and a *Betula,* were the only plants I had added to my catalogue; at night a large Wolverine came to our camp to steal, for which he was shot. We saw great numbers of *Anas Canadensis,* and one female of *Tetrao Canadensis.*

On Monday the 30th the heat was just the same as the day before, our elevation was seven hundred feet above the river. The route lay through a wood and a valley precisely similar to those we had passed yesterday, and during a walk of two miles and a half, we were obliged to ford the river seven times, keeping in a direct line from point to point. Four more miles, and as many times crossing the river, brought us to the termination of this platform or valley, and here the stream parts into two branches, the larger one flowing from the North, the other from due East. We crossed at the angle between the two streams, and commenced our ascent of the Big Hill. The snow being so deep, at least six feet, the markings on the trees which indicated the path were frequently hid, and we found it no easy matter to keep the track. The steep ascent, the deep gullies, the brushwood and fallen timber, rendered walking very laborious. We encamped two miles up the hill, having gained five miles to-day. The timber gradually becoming smaller, no new plants or animals were added to our store.

May 1st, Tuesday. This morning the thermometer stood at 2° below Zero, and the maximum heat at noon was 44°! We continued ascending, and had the satisfaction at ten to reach the summit, where we made a short pause to rest ourselves, and then descended the eastern side of the Big Hill, to a small round open piece of ground, through which flowed the smaller or East branch of the river, being the same as we had left yesterday at the western base of the Big Hill. To the right is a small point of low stunted wood of *Pinus nigra, alba,* and *Banksiana.* Near this place we started at mid-day a fine male specimen of *Tetrao Franklinii,* which I preserved with great care. Being well rested by one o'clock, I set out with the view of ascending what seemed to be the highest peak on the North. Its height does not appear to be less than 16,000 or 17,000 feet above the level of the sea. After passing over the lower ridge, I came to about 1,200 feet of by far the most difficult and fatiguing walking I ever experienced, and the utmost care was required to tread safely over the crust of snow. A few mosses and lichens, *Andreæ* and *Jungermanniæ* are observable, but at the elevation of 4,800 feet vegetation no longer exists; not so much as a *lichen* is found in a tract of 1,200 feet of eternal ice. The view from the summit is of too awful a cast to afford pleasure. Nothing can be seen, in every direction, far as the eye can reach, except mountains, towering above each other, rugged beyond all description; while the dazzling reflection from the snow, the heavenly azure of the solid glaciers, with the rainbow tints of their shattered fragments, and the enormous icicles suspended from the perpendicular rocks, and the majestic but terrible avalanches hurling themselves from the more exposed southerly rocks, produced a crash and groaned through the distant valleys with a sound only equalled by that of an earthquake. Such scenes give a sense of the stupendous and wonderful works of the Almighty. This peak, the highest yet known in the Northern Continent of America, I felt a sincere pleasure in naming "Mount Brown," in honour of R. Brown, Esq., the illustrious Botanist, a man no less distinguished by the amiable qualities of his mind than by his scientific attainments. A little to the southward is one nearly of the same height, rising into a sharper point; this I named "Mount Hooker," in honour of my early patron, the Professor of Botany in the University of Glasgow. This mountain, however, I was not able to climb. A species of *Menziesia, Andromeda hypnoides, Gentiana. Lycopodium alpinum, Salix herbacea, Empetrum, Juncus biglumis* and *triglumis* were among the last of the phœnogamous plants which I observed.

Wednesday, the 2nd. At three o'clock I felt the cold so much, and the thermometer only stood at 2° below Zero, that I was obliged to rise and enliven the fire to get myself comfortably warmed before starting. Through three hundred yards of gradually rising open low Pine-woods, we passed, and about the same distance of open ground took us to the basin of the mighty river—a small circular lake, twenty

yards in diameter, in the centre of the valley, with a small outlet on the West end, namely, the Columbia, and another at the East end, namely, one of the branches of the Athabasca, which must itself be considered one of the tributaries of the Mackenzie River. This is not the only fact of two opposite streams flowing from the same lake. This, "*the Committee's Punch Bowl,*" is considered as being half-way, and we were quite glad to know that the more laborious and arduous part of our journey was accomplished. The little stream, the Athabasca, over which we had stepped so conveniently, presently assumed a considerable size, and was dashed over cascades, and formed cauldrons of lime-stone and basalt. Seven miles below the pass, as do the tributaries of the Columbia on the western side, so the Athabasca widens into a narrow lake, and has a much greater distance than the Columbia. At this point, the snow had nearly disappeared, and the temperature was greatly increased. Many of the mountains on the right hand are at all seasons tipped with glaciers. At ten we stopped to breakfast, fifteen miles from the ridge, where we remained for four hours. The thermometer stood at 2° below Zero this morning, and had risen to 57° at two P. M., a heat which we found dreadfully oppressive. This afternoon, having set off a little before the party, I missed my way, and wandered from the path. As the sun was edging on the mountains, I descried about a mile off to the East, behind a low knoll, a curling blue smoke, rising from above the trees, a sign which gave me infinite pleasure. I quickened my steps, and soon came up to it, when I found Jacques Cardinal, who had come to the Moose Encampment, and brought with him eight horses to help us on our way. He treated me with an excellent supper of mutton, the flesh of Ovis montana (Geoff.), and regretted he had no spirits to offer me. Pointing to the stream, he jocularly said, "there's my barrel, and it is always running." The kind fellow also afforded me a part of his hut.

On the next morning, Thursday the 3rd, the whole party were brought up by Cardinal; they had been very uneasy at my non-appearance the preceding night. We breakfasted and proceeded by the banks of the stream, I preferring walking, though the ground was still soft from the recently melted snow, and strewed with timber of small size. The difference of climate and soil, with the amazing disparity in the variety and stature of the vegetation, is truly astonishing, one would suppose it was another hemisphere, the change is so sudden and so great. We crossed the principal branch of the Athabasca, which becomes a river seventy yards broad, when joined by the stream on the banks of which we had descended. Here it was our intention to camp for the night, but Cardinal found his horses so unexpectedly strong, that the route was continued to the Rocky Mountains' House where we were to find canoes, and which we gained soon after six P. M. Several partridges were killed, but the only plant new to me this day, was *Anemone Nuttalliana* (*A. patens, Hook.*), which was in full flower. The scenery here is very fine, with a small lake and open valley, commanding a sublime prospect of the mountains. Our distance to-day was thirty-four miles. On the following day (Friday) we embarked at day-light in two fine light birch canoes, and went rapidly before the stream, the banks of which are low and woody, in some places narrow, in others widening into narrow lakes full of sand shoals. We stayed to breakfast on a small low island in the Upper Lake, where we had some mountain-sheep's flesh, given us by Cardinal's hunter. Continuing our route, we passed a ridge of steep mountains on the right, and five miles lower down a similar range to the left, which are the termination of the dividing mountains on the East side, and arrived at Jasper House at two P. M. The minimum heat to-day had been 29°, the maximum 61°.

Saturday the 8th. This day presented scarcely any variety. The river is one hundred to one hundred and forty yards wide, shallow and rapid, with low gravelly banks, wooded with *Poplars* and *Pines*. Its vicinity abounds with wild fowl, and the Northern Diver charmed us with his deep mellow melancholy voice in the evenings.

Our progress was ninety-three miles. The following morning we had gained but three miles, when we were detained by the ice, and here we found Mr. G. M'Dougall. We got on slowly, owing to a portage, where the canoes had to be carried a considerable distance to a place where the main channel was clear, after which we proceeded rapidly, and arrived at Assinaboyne, one hundred and eighty-four miles from Jasper House the next day. But as this place afforded us but little food, we pushed on without delay for Lesser Slave Lake, where we hoped to meet Mr. J. Stewart, who received us there with the utmost kindness, and showed me in particular so much attention that I travelled partly with the Brigade, and latterly alone with a single guide on foot to Fort Edmonton, on the Saskatchawan River, which I reached on Monday the 21st. On the plains I killed several Curlews, and in the woods a number, both male and female, of *Tetrao Phasianellus*, the *Pin-tailed Grouse* of Edwards, with abundance of *T. Canadensis*. From May 21st to the 31st, I spent my time in exploring the country round Edmonton House, which is woody and interesting; after which I embarked in Mr. Stewart's boat for Carlton House. This mode of travelling gave me little time to botanize; I could only do so during the breakfast hour in the morning, and just before encamping in the dusk of evening, except when a halt was made for the purpose of hunting Buffalo and Red Deer. In some parts the scenery around the river is very varied and picturesque, especially near the Red Deer and Eagle Hills. The soil is dry and light, but not unfertile, with a rich herbage, belts and clumps of wood interspersed, which give it a most romantic appearance. Near this place many *Buffalo* were killed, with a few *Red Deer* and *Antelopes of the Plains*. This latter animal has so much curiosity, that he will approach within a hundred yards of the hunter, particularly if the latter wears any thing red, a colour which is sure to attract him. The *Buffalo* is easily killed by a skilful person. Among a variety of plants that I had not seen before were *Astragalus pectinatus* (*Phaca pectinata*, Hook. Fl. Bor. Am. v. 1. t. 54), and *Drummondii* (Hook. Fl. Bor. Am. v. 1. t. 57), *Phlox Hoodii*, *Thermopsis rhombifolia* (Hook. Fl. Bor. Am. v. 1. t. 47), *Hedysarum Mackenzii*, *Astragalus succulentus* (Bot. Reg. t. 1324), *A. caryocarpus* (Bot. Reg. t. 176), and seven species of *Salix*. On one of these hunting excursions, Mr. F. M'Donald was dreadfully injured by a wounded Buffalo Bull, which shockingly lacerated his left thigh, broke his ribs, dislocated his left wrist, and otherwise severely bruised him. These animals have a propensity not to destroy life at once, but to delight in torturing their victim. On first striking the object of their vengeance, if he be stunned, or feign death, there is a chance of escape, the creature mean time lying down beside him, and watching with a steadfast eye for the slightest motion, in which case he instantly rises and gives another blow. Poor M'Donald was thus situated for two hours and a half, bleeding and at the point of death, and that too under cloud of night, which afforded us scarcely any opportunity of rescuing him, for the animal lay watching within a few yards, and we were afraid to fire, lest a shot should strike our friend. By the activity of Mr. Heriot, and my assistance, he was, however, saved. I bound up his wounds, and gave him all the aid that a small medicine chest and my slender knowledge of surgery would suggest. Hence we passed hastily onwards in hope of meeting Dr. Richardson, but on our arrival found that he had gone to Cumberland House. At Carlton House I had the pleasure of meeting with Mr. Drummond,[1] of Capt. Franklin's party, who had spent the greater part of his time in exploring the Rocky Mountains contiguous to the sources of the Rivers Athabasca and Columbia, where he had made a princely collection. I had intended to cross the plains from this place to Swan and Red Rivers, but the hostile disposition of the Stone Indians rendered it unsafe. I therefore descended to Cumberland House, where I found Dr. Richardson, who kindly showed me por-

[1] Mr. Drummond's Journal of that expedition is given at page 178 of the first volume of our "Botanical Miscellany."

tions of the noble collections in Natural History made during the expedition. This part of the country has been so well described in the former narrative of Capt. (now Sir John) Franklin, that little is left for me to say respecting it, and I shall merely notice my stages. After leaving Cumberland House, two days took us to the Grand Rapid, the entrance of Lake Winipeg, where we were detained by the ice. A few hours after it became rotten, sank and disappeared, leaving an open sheet of water, through which we sailed to Norway House. The shores of this lake are clothed with diminutive trees, *Pinus alba, nigra, microcarpa, Populus trepida, Betula papyracea* and *nigra*, and sphagnous swamps of *Ledum, Kalmiæ*, and *Andromeda*, together with a strong herbage of various species of *Carex*, near the springs or pools. On the 16th we arrived at Norway House, where I found letters from England. The following day Mr. Simpson, the Resident Governor of the Hudson's Bay Company, came, and I received great kindness from him; and after I had spent several days at Norway House, Capt. Sir J. Franklin made his appearance, and most politely offered me a passage in his canoe through the lake as far as the mouth of Winipeg River, on my way to Red River, which I gladly accepted. At this period, such an opportunity of saving time was most valuable, as I thus gained twelve days on the usual time required for performing the trip. Captain Franklin left me for England on the 9th of July, and on the following day I proceeded to the settlement on the Red River, which I reached on the 12th. I took up my abode with D. M'Kenzie, Esq., Governor of the Colony, a most kind and excellent man, who during my whole stay showed me great hospitality, and afforded me much valuable assistance. Mr. M'Kenzie's knowledge of the country, particularly to the West of the Rocky Mountains, where he had spent many years, was particularly useful to me. I had also the pleasure to make the acquaintance of the Rev. David Jones and R. W. Cochrane, at the English Mission House, an admirable establishment, which owes much of its value to the unremitting care and zeal of these gentlemen, whose lives are devoted to the charge of the little flock over which they are called to preside. It was also a pleasure to me to become acquainted with the Rev. J. N. Provenchier, the worthy Catholic Bishop, a person of liberal disposition and highly cultivated mind, who lives only to be useful and do good. The soil is exceedingly fertile, capable of bearing any kind of produce, being a deep alluvial stratum of brown loam over a gravel or limestone bottom. The settlers here live comfortably, and seem happy. The crops are liable to be attacked by grasshoppers; but the wheat is exempted from smut and rust. Cattle thrive well, as do pigs and horses; sheep had not then been introduced. During a month's residence here, I formed a small Herbarium of two hundred and eighty-eight species, many of them new to me, and the more interesting, because, if I had staid with Dr. Richardson or Mr. Drummond on the Saskatchawan, I should probably have added hardly any thing to the Flora of the country. With Mr. Hamlyn, the surgeon to the colony, I set off and had rather a tedious passage through the lake. Arriving at York Factory, Hudson's Bay, I was kindly received by J. G. M'Tavish, Esq., the Chief Factor, who had the goodness to order some travelling equipments for me, my own stock being completely worn out.

Here ended my labours, and I may be allowed to state, that when the natural difficulties of passing through a new country are taken into view, with the hostile disposition of the native tribes, and the almost insuperable inconveniences that daily occur, I have great reason to consider myself a highly favoured individual. All that my feeble exertions may have effected, only stimulate me to fresh exertions. The whole of my botanical collections, with the exception of some few, were, agreeably with my anxious wishes, given for publication in the forthcoming North American Flora of Dr. Hooker. I sailed from Hudson's

Bay on the 15th of September, and arrived at Portsmouth on the 11th of the following month."

D. DOUGLAS.

Thus happily terminated Mr. Douglas' first adventurous journey in North America, a journey extending from the Pacific to the source of the Columbia river, and thence to the Atlantic Ocean. Among the many dangers to which he was exposed, was that one recorded by Mr. Drummond (who, with Capt. Back and Lieut. Kendal, was of the party), in the first volume of the Botanical Miscellany (p. 216.); when in a small open boat in Hudson's Bay, they encountered so dreadful a storm, and were so short of provisions, that their escape seemed little short of a miracle. Mr. Douglas in particular suffered severely, and was confined to his bed during the greater part of the voyage home. It was fortunate that he directed his scientific researches chiefly to the western side of the Rocky Mountains; for, during the very time that he was carrying on his investigations there, his countrymen, Dr. Richardson and Mr. Drummond, were exploring the territories to the eastward of that vast stretch of the Cordillera: the former chiefly in the arctic regions, the latter in nearly the same parallels of latitude with Mr. Douglas: and the result of their combined exertions has been a mass of collections that have thrown a new light on the Natural History of those interesting regions, and have supplied the materials for Dr. Richardson's inestimable works on the *Quadrupeds, Birds* (in which he was assisted by Mr. Swainson), and *Fishes* of that country, as well as that which is preparing on the *Insects* by Mr. Kirby; and of our *Flora Boreali-Americana*. These will constitute a lasting memorial of Mr. Douglas' zeal and abilities; whilst not only in this country, but throughout Europe, and in the United States of America, there is scarcely a spot of ground deserving the name of a *Garden*, which does not owe many of its most powerful attractions to the living roots and seeds which have been sent by him to the Horticultural Society of London.[1] Dr. Lindley has favoured me with the following list of species which have thus been introduced by him, the greater proportion of which are figured in the Botanical Register, and have now become common in our gardens.

LIST OF PLANTS, INTRODUCED BY MR. DOUGLAS, IN 1826—7.

Abronia mellifera.
Acer circinnatum.
—— macrophyllum.
Amelanchier florida.
Anemone Hudsoniana.
Arbutus procera.
—— tomentosa.
Astragalus succulentus.
Benthamia lycopsioides.
Berberis Aquifolium.
—— glumacea.
Brodiæa congesta.
—— grandiflora.
Calochortus macrocarpus.
—— nov. sp.
Caprifolium Douglasii.
—— ciliosum.
—— hispidulum.
Castilleja coccinea.
Chelone nemorosa.
Clarckia elegans.
—— gauroides.
—— pulchella.
Clematis Virginiana.
Clintonia elegans.
—— pulchella.
Collomia grandiflora.
—— bellidifolia.
—— gracilis.
—— linearis.
—— pinnatifida.
Collinsia bicolor.
—— grandiflora.
—— parviflora.
Coreopsis Atkinsoniana.
Cornus alba.

[1] A young friend of ours, who has lately (summer of 1836) visited Hammerfest in Norway, the most northern town in the world, in lat. 71°, saw the *Clarckia pulchella* cultivated in pots in the windows of the apartments, and very much prized.

Cratægus Douglasii.
Delphinium Menziesii.
Donia villosa.
Epilobium minimum.
Eriogonum compositum.
——— nudum.
Eriophyllum cæspitosum.
Erythronium grandiflorum.
Eschscholtzia Californica.
Eutoca divaricata.
——— multiflora.
——— viscida.
Gaillardia aristata.
Garrya elliptica.
Gaultheria Shallon.
Geranium Carolinianum.
Gilia achilleæfolia.
—— capitata.
—— pungens.
—— splendens.
—— tricolor.
Helianthus lenticularis.
Helonias tenax.
Heuchera micrantha.
Horkelia congesta.
Hosackia bicolor.
Hyssopus urticæfolius.
Ipomopsis elegans.
Iris tenax.
Lathyrus Californicus.
Lilium pudicum.
Linum Lewisii.
—— Sibiricum.
Lupinus arbustus.
——— albifrons.
——— aridus.
——— bicolor.
——— densiflorus.
——— flexuosus.
——— grandiflorus.
——— hirsutissimus.
——— laxiflorus.
——— leptophyllus.
——— lepidus.
——— leucophyllus.
——— littoralis.
——— lucidus.
——— micranthus.
——— nanus.
——— ornatus.
——— polyphyllus.
Lupinus var. albex.
——— plumosus.
——— rivularis.
——— succulentus.
——— tristis.
——— Sabinianus.
Malva Munroana.
Mimulus Cardinalis.
——— floribundus.
——— guttatus.
——— moschatus.
——— roseus.
Nemophila insignis.
Nicotiana multivalvis.
Œnothera albicaulis.
——— decumbens (pallida, L.).
——— dentata.
——— lepida.
——— Lindleyana.
——— muricata.
——— quadrivulnera.
——— rubricunda.
——— viminea.
——— vinosa.
Pentstemon acuminatum.
——— attenuatum.
——— confertum.
——— deustum.
——— diffusum.
——— glandulosum.
——— gracile.
——— ovatum (pruinosum).
——— Richardsoni.
——— Scouleri.
——— speciosum.
——— staticæfolium.
——— triphyllum.
Phlox speciosa.
Pinus Douglasii.
—— Lamberti.
—— ponderosa.
Potentilla arachnoidea.
——— arguta.
——— effusa.
——— glandulosa.
——— obscura.
——— pectinata.
Prunus depressa.
Pyrus rivularis.
Ribes cereum.
—— divaricatum.

Ribes echinatum.
—— glutinosum.
—— irriguum.
—— lacustre.
—— malvaceum.
—— niveum.
—— petiolare.
—— sanguineum.
—— setosum.
—— speciosum.
—— tenuiflorum.
—— viscosissimum.
Rubus leucodermis.
—— leucostachys.
—— longipetalus.
—— Nutkanus.
—— spectabilis.
Scilla (Camassia) esculenta.
Sida malvæflora.
Silene inamæna.
Spergula ramosissima.
Spiræa Americana.
—— ariæfolia.
—— Aruncus.
Symphoria racemosa.
Tanacetum boreale.

Qualified, as Mr. Douglas undoubtedly was, for a traveller, and happy as he unquestionably found himself in surveying the wonders of nature in its grandest scale, in conciliating the friendship (a faculty he eminently possessed) of the untutored Indians, and in collecting the productions of the new countries he explored; it was quite otherwise with him during his stay in his native land. It was, no doubt, gratifying to be welcomed by his former acquaintances, after so perilous yet so successful a journey, and to be flattered and caressed by new ones; and this was perhaps the amount of his pleasures, which were succeeded by many, and, to his sensitive mind, grievous disappointments. Mr. Booth remarks, in his letter to me on this subject, "I may here observe, that his appearance one morning in the autumn of 1827, at the Horticultural Society's Garden, Turnham Green, was hailed by no one with more delight than myself, who chanced to be among the first to welcome him on his arrival, as I was among the last to bid him adieu on his departure. His company was now courted, and unfortunately for his peace of mind he could not withstand the temptation (so natural to the human heart) of appearing as one of the *Lions* among the learned and scientific men in London; to many of whom he was introduced by his friend and patron, Mr. Sabine. Flattered by their attention, and by the notoriety of his botanical discoveries, which were exhibited at the meetings of the Horticultural Society, or published in the leading periodicals of the day, he seemed for a time as if he had attained the summit of his ambition. But alas! when the novelty of his situation had subsided, he began to perceive that he had been pursuing a shadow instead of a reality." As some further compensation for his meritorious services, the Council of the Horticultural Society agreed to grant him the profits which might accrue from the publication of the Journal of his Travels, in the preparation of which for the press, he was offered the assistance of Mr. Sabine and Dr. Lindley: and Mr. Murray of Albemarle-street was consulted on the subject. But this proffered kindness was rejected by Mr. Douglas, and he had thoughts of preparing the Journal entirely himself. He was, however, but little suited for the undertaking, and accordingly, although he laboured at it during the time he remained in England, we regret to say, he never completed it. His temper became more sensitive than ever, and himself restless and dissatisfied; so that his best friends could not but wish, as he himself did, that he were again occupied in the honourable task of exploring North-west America. The Hudson's Bay Company, as upon the former occasion, made a most liberal offer of assistance, and it was resolved that he should go again to the Columbia River, partly at the expence of the Horticultural Society and partly with the assistance of the Colonial Office: for his geographical observations and the friendship of Mr. Sabine had recommended him to the brother of this latter gentleman, Capt. Sabine, who

showed at all times the utmost kindness, made him known to the Colonial Office, gave him most important instructions at the Greenwich Observatory, and found in him so apt and so grateful a pupil, that a cordial friendship was established, which continued to the last. The original plan of his route was communicated to me by Mr. Douglas, in a letter bearing date,

London, August 6th, 1829.

"I am sure you will be glad to know that my anticipated journey has been laid before the Council, and approved of; so that I go, God willing, on the 15th of September, by the Hudson Bay Company's Ship Eagle. My plans must be a separate communication, but just let me say, that my principal objects are to make known the vegetable treasures of the Interior of California, from the northern boundaries of Mexico, near the head of the Gulf. The botanical productions of Rio Colorado and other streams, totally unknown in Europe, will, I trust, ere many years, be as familiar as those of the Columbia. The Government provides me with every instrument which Captain Sabine, as Secretary of the Royal Society thinks may be of use. These consist of sextants, chronometers, barometers, thermometers, hygrometers, compasses of all sorts, instruments for magnetic intensity, dip of the magnetic needle, all of which can be used with such accuracy, as will render my journey, as I trust, not the journey of a common-place tourist.

"I am not quite certain, but that when I have completed my expedition on the Continent of America, I may cross to the opposite shore, and return in a southerly line, near the Russian frontier with China. What a glorious prospect! Thus not only the plants, but a series of observations may be produced, the work of the same individual on both Continents, with the same instruments, under similar circumstances, and in corresponding latitudes! I hope I do not indulge my hopes too far. I shall try to set a hundred pairs of feet, and as many of hands to work for me, and shall make them grub up and bring me all they can find. People tell me that Siberia is like a rat-trap, which there is no difficulty in entering, but from which it is not so easy to find egress. I mean at least to put this saying to the test. And I hope that those who know me know also that trifles will not stop me. I am glad to learn you are coming to England, before I go, that I may see you once more. I shall be greatly obliged if you would purchase for me a Bible, in 2 vols. 8vo., with a good bold legible type, and notes of reference, or more properly speaking, marginal notes. I cannot see to read small type, and have been unable to find such an one in London, but I know there is a Scotch edition of the kind which I describe. I intend to procure the skulls of dogs, wolves, and bears for Scouler; but *none of men*, for fear he should make a second voyage to the North-west coast, and find mine bleached in some canoe, 'because I stole from the dead,' as my old friends on the Columbia would say." Mr. Douglas here refers to Dr. Scouler's having carried away from the Columbia River, the preserved skulls of two Chenooks, on account of the singular mode in which, by compressing the frontal bone in infancy, the heads of these people are made to assume a conical, almost sugar-loaf appearance. The indignation of the natives was much roused on this occasion, and Dr. Scouler would probably have met with very rough treatment, if he had not deferred this robbery for the sake of science to the very night previous to the vessel's sailing from the Columbia River, by which he was carried out of the reach of their resentment.

Extracts from two other letters, now before me, written previous to his departure, will perhaps be read with interest; and if it shall appear that I have suffered any passage to come before the public which was only intended for a private communication, I trust that my motive in so doing will not be attributed to personal vanity, but to the real cause—my desire to commemorate the generosity of Mr. Douglas'

heart, and his grateful disposition whenever any act of kindness was shown him.

Greenwich, Sept. 14, 1829.

"I am exceedingly engaged in my preparations, and will soon be ready. The vessel is to sail not later than the end of this month, which delights me amazingly. I go under most comfortable circumstances, and am certainly very happy. All my instruments are ready, save the chronometer, which I hope to be in possession of within a few days, all packed and ready to be sent on board ship at an hour's notice. Nothing pleases me so much as the addition of £20 which has been given me by the Colonial Office; I asked for £60 to provide books, tables, and charts, and they sent £80, as also some instruments, which, though previously used by other persons, are in perfectly good order. I ought to think myself a very lucky fellow, for indeed every person seems to take more interest than another in assisting me. I possess a beautiful assortment of barometers, so constructed that, comparatively speaking, there is scarcely any liability of derangement, an object of most desirable attainment in these instruments. I shall combine observations accurately made with the hygrometer on different altitudes on the mountains and in different latitudes, which will, I trust, furnish you with information that can be confidently relied on, and which will effect much in illustrating the Geography of Plants. I shall take great care of Fuci. You have heard from Dr. Mertens,[1] who doubtless told you of his splendid voyage. He possesses the gigantic sea-weed of which I spoke, and has named it *Fucus Lutkeanus*, after the captain of the vessel. I spent ten days with Captain Lutke here, and was highly pleased with him: he gave me letters to Baron Wrangel, Governor of the Russian Colonies in America, and of the Aleutian Isles, as also circulars to Siberia. The Baron is a man of vast information, and joins heart and hand with all those who have scientific views. I spent a few days with Dr. Mertens, and would gladly have accompanied him to Sheerness to see his drawings, had I had the time to spare. He tells me that he found a second species of shrubby *Pyrola*, a more robust plant than yours.[2] The expedition did not touch lower down on the coast than Norfolk Sound, and I should conceive that most of their plants (indeed Dr. Mertens said so, for I showed him all mine) are very different from those collected either by Captain Beechey's party or myself. Did you hear of the total wreck of the Hudson Bay Company's ship on the sand-bar at the entrance of the Columbia River, with the loss of every individual on board, forty-six in number, on the 11th of March last? It was the vessel in which Dr. Scouler and I went out in 1824, when the late Captain was First-Mate. It is stated that those who escaped from the wreck were destroyed by my old friends, the Chenooks. This may be true, though I confess I entertain some doubts, for I have lived among those people unmolested for weeks and months. The temptation, however, of obtaining the wreck, may have overcome their better (if indeed they possess any) feelings. Though this is far from agreeable news, and though the name of my new Captain (Grave) may sound ominous, I shall yet venture among these tribes once again. I doubt not I can do as much as most people, and perhaps more than some who make a parade about it. I shall write every day and write every thing, so that my drivelling will return home, though perhaps I may not.

"I shall feel the greatest pleasure in communicating with Dr. Richardson; it will be quite a comfort to place any of my discoveries in the hands of one who will give them so creditably to the world.

"It is uncertain where I may touch in my passage out, or indeed if at all on the

[1] The son of Professor Mertens of Bremen, who accompanied Capt. Lutke, as Naturalist, in the last Russian voyage of discovery. His account of Sitka is given at vol. 3, p. 12, of the Botanical Miscellany.

[2] It proves to be the same plant, a new genus, my *Tolmiæa occidentalis* (Fl. Bor. Am. v. 2. p. 45.) but had been, a little time previously, published by M. Bongard, under the name of *Cladothamnus pyrolifloræ*.

Brazilian coast. I believe it is pretty certain we shall spend a month on the Sandwich Islands, where something may, I trust, be done, both in Botany and Zoology.

"I regret to hear that you are not likely to be in England this autumn; for to Scotland I cannot go, which obliges me, most reluctantly, to sail without seeing you. In a few days I shall write to you my, for the present, last, letter. I had almost forgotten to say, that I have put the last impression of your map through my hands. It is very fine, and will surely please you. The route of Franklin, Richardson, and Drummond is marked in RED, Parry's in BLUE, and mine in YELLOW. I must have the latter tint changed to green, for yellow is a most sickly hue for a *culler of weeds*."

London, Oct. 27th, 1829.

"I received, in due course, the letter you were so kind as to address me at Greenwich, and am delighted to know that Dr. Mertens has promised to send you part of his plants, which must be a great acquisition. I cannot tell you how pleased I am to have seen the first Part of your *Flora Boreali-Americana* before sailing, and that I am enabled to take it with me to America. The map is good, and will increase the interest of the book; had it been printed on thinner paper, I think, however, it would have been still better. The plates are truly beautiful; but I see you have not given a figure of *Pæonia* (*P. Brownii*). The type is also good, and the notices and habitats full—a point of great importance. I have been, and still am, deeply engaged, and would continue so, if I had another season to remain here, for I have much to learn, to do, and to think, as to my anticipated journey. I know it will give you satisfaction to hear that every facility in the way of instruments for such an expedition has been granted me in the handsomest manner by the Colonial Office. And further still, Mr. Hay, the Under Secretary, sent to enquire if any thing had been forgotten, and begged me to say unhesitatingly if this were the case. The same Office also pays the principal part of my expenses, and will give me a compensation for my charts, and for the information I may bring home on my return. This is all as it ought to be—I mean the latter part of the agreement; if I had a good salary, I might fold my hands and become lazy, therefore I can feel no objection to being paid according to my labour. I hope, ere the whole of the *Flora* is printed, to be able to supply you with many and striking novelties. I am sensible of the great advantage I derive from my former experience of travelling in the country, of hunting, collecting, &c.; and certainly if I find the Indian tribes as quiet as when I left them, much good may be effected. Of this, however, I feel considerably afraid, in consequence of the destruction of the Hudson Bay Company's Ship's crew, and the murder of some parties of Americans, by which I am warned to walk with great caution, and more reservedly than before. If I find the natives hostile to the "Man of Grass" (the name by which Mr. Douglas was generally known among them), I must shift my quarters to some other part of the country. I shall take the list of my Canadian plants to-day to Treuttel and Würtz's for you, and am also sending to Dr. Richardson a notice of the Zoology of North-West America, to be published in the last volume of his *Fauna*. I am hourly expecting the summons to sail, and am not aware that we shall touch at any place, except the Sandwich Islands, where it is intended to make a short stay. By every opportunity, it will be my sincere pleasure to write to you, and tell you of my progress and plans; and I cannot express the delight which I always feel in hearing from you, more especially when I am separated from you by seas and distant lands, and yet busily employed in gathering and sending you the plants of those regions. I therefore entreat that, if it be only a few lines, you will do me the favour to write, or cause your sons to do so. It is not likely my time will permit me to address you again before sailing,—let me therefore repeat once more how sincerely I feel myself indebted to you, not for much, but for all that I possess; and that the

many favours and kind attentions I have always received from you command my warmest gratitude."

ACCOUNT OF MR. DOUGLAS' SECOND VISIT TO THE COLUMBIA; HIS EXCURSIONS IN CALIFORNIA; AND HIS VISIT TO MOUNA ROA IN THE SANDWICH ISLANDS; WITH PARTICULARS RESPECTING HIS DEATH.

Productive as was the first mission of Mr. Douglas to the western shores of North America, the second was undertaken under far more favourable auspices. He had acquired knowledge of the most valuable kind—that gained by *experience*, and often, as has been seen in the preceding part of the memoir, by dear-bought experience:—he was well acquainted with the language and customs of the various tribes of people on the Columbia and its tributaries;—and, in addition to his familiarity with the several branches of Natural History, he had profited so much by the able instructions of Capt. Sabine, that he could not fail to make observations in other departments of Science, especially such as should bear upon magnetic and atmospheric phænomena, and on the Geography of the countries he would visit. Hence it was that the Colonial Office, at the suggestion of Capt. Sabine, supplied him with an excellent set of instruments: and I may here remark, that the result of these investigations, communicated to the Colonial Office from time to time, as well as to Capt. Sabine, has been duly appreciated by the latter gentleman, and will, at no distant period, be laid before the public.

The expenses of this mission were, in great part, to have been defrayed by the Horticultural Society of London, of which Mr. Sabine was still Secretary; but when those changes took place in that Institution, the particulars of which are familiar to all who have felt an interest in the success of Horticultural Botany in this country, and in consequence of which Mr. Bentham became the Honorary Secretary in the room of Mr. Sabine, Mr. Douglas wrote from the Columbia, resigning his appointment of Collector to the Society, and he withdrew altogether from its service; sending to it, however, at the same time, all the collections he had made up to that period, but declaring his intention, nevertheless, to transmit all seeds and living plants he might procure, as a present to the Garden. This determination, which arose from some misunderstanding, is deeply to be regretted, not only because we know, from our acquaintance with Mr. Bentham's character and feelings upon the subject, that this gentleman would have exerted himself to the uttermost to further Mr. Douglas' success: but because to this circumstance may perhaps be attributed the loss of nearly the whole of his Journals. To that Society, during the former expedition, they were from time to time carefully despatched; but now there was no one to whom he was bound to communicate the result of his investigations and labours: and with the remnant of his collections, sent home after his death, no Journal has appeared, save that of his *Voyage from the Columbia to the Sandwich Islands* and the *Ascent of Mouna Roa*.

All that I have to offer, therefore, respecting his excursions in the Hudson's Bay territories and in California, where he reaped such a glorious harvest of plants, must be collected from his letters to his friends; and these almost exclusively from what he sent to the writer of this article, to whom he appears to have opened his mind more confidentially, and to have been more full in point of matter, than to almost any other of his correspondents, some of whom have kindly permitted a perusal of their letters. The first I had the happiness to receive from him was dated,

Entrance of the River Columbia,
Oct. 11th, 1830.

How much do I feel indebted to you for your long and kind letter of Christmas-day, 1829! I received it two months ago, four days after I had left my head-quarters for an extensive journey in the Cordilleras of

New Albion, and what a stimulus it was to me! Situated as I am, without any one of kindred feelings, to share my labours and my toils and anxiety, such a letter makes all one's troubles seem light! I should indeed be delighted to have such a companion as the gentleman whom you describe, and whom I have hitherto only known by report. More than ten times as much could be effected by the united exertions of two.

I must now pass from London to Oahu, in the Sandwich Islands, all in one line! The ship touched no where on the eastern shore of South America, which to me was a great loss and disappointment, for I had anticipated much advantage from researches made on that Continent and the Islands of the South Seas. It was not my fortune to climb the snowy Peak of Mouna Kaah, the highest ground in the known world, in that system of mountains; nor could I get to Mouna Roa, which at this instant is dreadfully agitated by volcanic fires, and has the largest crater ever seen by mortal eyes; but I did what was of more service to Botany, in scaling the lofty and rugged peaks of Mouna Parrii, the seat of the great Akua, or God of Fire. The season was unfavourable, very rainy, and being just the conclusion of winter, I could only obtain Mosses and Ferns. I hope yet to visit this place again, under more favourable circumstances. I am most desirous of collecting materials for a Flora of this groupe, and think that one season, spent in botanizing among them, with the aid of the Banksian Herbarium, might effect this object. The culminating points offer an almost unrivalled field for studying the Geography of Plants, from the *Line of Palms* to that of the *Lichens*. I was delighted with the people and with the kind treatment I received, especially from those individuals who had formed part of his late Majesty Riho-Riho's suite when he visited Britain. Madam Boki, the Governess of the Island, entertained me splendidly. I possess copies of all the books that have been published in Oahu, and the other islands, splendidly bound in tortoiseshell for your library, but have at present no convenient opportunity of sending them. The printing and all the workmanship is done by the islanders themselves. I arrived here on the 3rd of June, in eight months, from London; the passage was very pleasant, as a fine gentlemanly person, a Lieutenant in the Royal Navy, was Captain. The lateness of my arrival, for it was the 1st of July before I could leave the coast for the Interior, has been a very serious drawback; the season proving unusually early, all the vernal plants, which are by far the most numerous, beautiful, and curious here, were withered and decayed. It took me twenty-four days of hard labour to reach the very lofty chain of mountains on which I was in July, 1826; I again found my *Pæonia* (*P. Brownii*, Dougl. in Hook. Fl. Bor. Am. v. 1. p. 27), and including all my labours, there are, I should think, full one hundred new species, and perhaps some new genera, though I have yet only determined one, which is akin to *Œnothera*.

I have now just saved the sailing of the ship, and, after sixty days of severe fatigue, have undergone, as I can assure you, one of still more trying labour, in packing up three chests of seeds, and writing to Mr. Sabine and his brother. The Captain only waits for this letter, after which the ship bears away for Old England; I am truly sorry to see her go without my dried plants, but this is unavoidable, as I have not a bit of well-seasoned wood in which to place them, and should, moreover, be unwilling to risk the whole collection in one vessel; and the sails are already unfurled, so that it would be impossible to attempt dividing them. I however transmit one bundle of six species, exceedingly beautiful, of the genus *Pinus*. Among these, *P. nobilis* is by far the finest. I spent three weeks in a forest composed of this tree, and day by day could not cease to admire it; in fact, my words can be only monotonous expressions of this feeling. I have added one new species during this journey, *P. grandis*, a noble tree, akin to *P. balsamea*, growing from one hundred and seventy to

two hundred feet high. In the collection of seeds, I have sent an amazing quantity of all the kinds. Your specimens are in every way perfect. I have a few Mosses and a considerable number of *Fuci:* this is a department in which I fear the Flora will be deficient; but as I am to spend this winter entirely on the coast, you may expect to receive all that are found within the parallels of the British possessions on the Pacific side of this continent. I have already preserved some beautiful specimens of this tribe for the use of your lectures, the principal of which is *Fucus Lutkeanus*[1] of Mertens, the one which you may remember my endeavouring to describe to Mr. Dawson Turner—(the author of the *Historia Fucorum*).

On the direction of my next year's route, I am not yet decided; but my desire is to prosecute my journey in North California, in the Valley of Bonaventura, through which a stream of considerable magnitude flows, and finally mingles its streams with the ocean in the Bay of Montérey. If I can venture thither in safety by land, I will do so; if not, I shall go by sea to Montérey. The southern termination on the map is the source of the river, and the spot where, in October 1826, I had such a narrow escape from the hostile tribes[2] who inhabit that country. Since that time, a party of hunters were all killed, save two, who returned to tell the melancholy fate of their companions; and again a second party has nearly shared the same fate. You may judge of my situation, when I say to you that my rifle is in my hand day and night; it lies by my side under my blanket when I sleep, and my faithful little Scotch terrier, the companion of all my journies, takes his place at my feet. To be obliged thus to accoutre myself, is truly terrible. However, I fail not to do my best, and if unsuccessful in my operations, can make my mind easy with the reflection that I used my utmost endeavours. My instruments are all excellent, and in the best order, and have already enabled me to make a multitude of important observations, which will go some way towards perfecting the Physical Geography of this part of the country, as well as illustrating its magnetic phænomena.

In Zoology, I possess some valuable additions to the *Fauna,* consisting of quadrupeds, birds, reptiles, and insects, which, as well as the plants, must remain with me till next year.

A dreadfully fatal intermittent fever broke out in the lower parts of this river about eleven weeks ago, which has depopulated the country. Villages, which had afforded from one to two hundred effective warriors, are totally gone; not a soul remains! The houses are empty, and flocks of famished dogs are howling about, while the dead bodies lie strewed in every direction on the sands of the river. I am one of the very few persons among the Hudson Bay Company's people who have stood it, and sometimes I think, even I have got a *great shake,* and can hardly consider myself out of danger, as the weather is yet very hot.

The ship which sailed along with us was totally wrecked on entering the Columbia River; I am happy to say, however, no lives were lost. To this vessel I had first been appointed, and then changed to the one in which I came. But for this fortunate alteration, I should have lost my all: and think what a plight would mine have been, on "Cape Disappointment," deprived of every thing! You will see the account of this disaster in the newspaper.

Farewell. I am daily, in recollection, with you and your family, though so unfortunate as to be divided from you by half the diameter of the globe; still the thought of you affords me, in my lonely walks, an inexhaustible source of delight.

I thank Mr. Murray and Dr. Scouler for their kind letters; to both I mean to write in spring, and shall send some articles of Comparative Anatomy to the latter.

To Dr. Hooker.

[1] For a most interesting account of which see v. 3. p. 5. of the Botanical Miscellany.

[2] See p. 131 of this volume.

Montérey, Upper California,
Nov. 23rd, 1831.

In the absence of all individuals with kindred feelings, who can participate in our pleasures, and console us in adversity, how cheering is the task of writing to them, and more especially when we have been long deprived of their conversation, and severed by a space of no less than half the diameter of the world! Greater still, however, is the delight with which the solitary traveller hears of the welfare of those who are dear to his remembrance in his native land. I am not ashamed to say that this pleasure stimulates me to exertion, and lightens my labour. Though I have not written to you since last year, I am daily with you in thought, and were it not that I sometimes persuade myself that my feeble exertions in this country may, ere long, yield pleasure to my friends in enabling them to look at its beautiful plants, I could gladly return home, to assure you in person of my regard.

I have had only one letter from you, dated on "Christmas-day, 1829," for which I am abundantly thankful. From no other person have I received any news, and shall therefore trouble no one else with my scribbling.

On the 22nd of December last (1830), I arrived here by sea, from the Columbia, and obtained leave of the Territorial Government to remain for the space of six months, which has been nearly extended to twelve, as the first three months were occupied in negociating this affair, which was finally effected to my satisfaction. I shall now endeavour to give you a brief sketch of my walks in California.

Upper California extends from the Port of St. Diego, lat. 32° 30′ to lat. 43° N., a space of six hundred and ninety miles, from North to South. The Interior is but partially known. Such parts of the country as I have seen are highly diversified by hills, covered with *Oaks, Pines, Chestnuts,* and *Laurels*, extensive plains, clothed with a rich sward of grass; but no large streams. Well does it merit its name! The heat is intense, and the dryness of the atmosphere invariable, 29° not unfrequently, which, if I mistake not, is not exceeded in Arabia or Persia. In this fine district how I lament the want of such majestic rivers as the Columbia! In the course of my travels on the western and northern parts of this continent, on my former as well as my present journey, I have observed that all mountainous countries, situated in a temperate climate, agitated by volcanic fires, and washed by mighty torrents which form gaps or ravines in the mountains, lay open an inexhaustible field for the researches of the Botanist. Early as was my arrival on this coast, spring had already commenced; the first plant I took in my hand was *Ribes speciosum,* Pursh (Bot. Mag. t. 3530; Bot. Reg. t. 1557), remarkable for the length and crimson splendour of its stamens; a flower not surpassed in beauty by the finest *Fuchsia;* and for the original discovery of which we are indebted to the good Mr. Archibald Menzies, in 1779. The same day I added to my list *Nemophila insignis* (Bot. Reg. t. 1713; Bot. Mag. t. 3485), a humble, but lovely plant, the harbinger of Californian spring, which forms, as it were, a carpet of the tenderest azure hue. What a relief does this charming flower afford to the eye from the effect of the sun's reflection on the micaceous sand where it grows. These, with other discoveries of less importance, gave me hope. From time to time, I contrived to make excursions in this neighbourhood, until the end of April, when I undertook a journey southward, and reached Santa Barbara, 34° 25′, in the middle of May, where I made a short stay, and returned late in June, by the same route, occasionally penetrating the mountain-valleys which skirt the coast. Shortly afterwards I started for San Francisco, and proceeded to the North of that port. My principal object was to reach the spot whence I returned in 1826, which I regret to say, could not be accomplished. My last observation was at 38° 45′, which leaves an intervening blank of sixty-five miles. Small as this distance may appear to you, it was too much for me!

My whole collection of this year in

California, may amount to five hundred species, a little more or less. This is vexatiously small, I am aware; but when I inform you that the season for botanizing does not last longer than three months, your surprize will cease. Such is the rapidity with which spring advances, as on the table-lands of Mexico and the platforms of the Andes in Chili, the plants bloom here only for a day. The intense heats set in about June, when every bit of herbage is dried to a cinder. The facilities for travelling are not great, whereby much time is lost: this, as a matter of course, is the case in all new countries. It would require at least three years to do any thing like justice to the Botany of California, and the expense is not the least of the drawbacks. At present, it is out of my power to effect any thing further, and must content myself with particularizing the collection now made. Of new genera I am certain there are nineteen or twenty, at least, and I hope you will find many more. Most of them are highly curious. As to species, about three hundred and forty may be new. I have added a most interesting species to the genus *Pinus, P. Sabinii,* one which I had first discovered[1] in 1826, and lost, together with the rough notes, in crossing a rapid stream on my return northward. When compared with many individuals of the genus inhabiting the western parts of this continent, its size is inconsiderable, from 110 to 140 feet high, and 3 to 12 feet in diameter. In the aqueous deposits on the western flanks of the Cordilleras of New Albion, at a very great elevation above the sea (1,600 feet below the line of perpetual snow), this *Pine* grows somewhat larger than in the more temperate parts near the coast in a more southern parallel. I sent to London a detailed account of this most beautiful tree, to be published in the Transactions of the Horticultural Society, which you will see before this can reach you, so that I will not trouble you with a further description of it. But the great beauty of Californian vegetation is a species of *Taxodium,* which gives the mountains a most peculiar, I was almost going to say awful, appearance—something which plainly tells that we are not in Europe. I have never seen the *Taxodium Nootkatensis* of Nees, except some specimens in the Lambertian Herbarium, and have no work to refer to; but from recollection I should say, that the present species is distinct from it. I have repeatedly measured specimens of this tree 270 feet long and 32 feet round at three feet above the ground. Some few I saw, upwards of 300 feet high; but none in which the thickness was greater than those I have instanced. I possess fine specimens and seeds also. I have doubled the genus *Calochortus; C. luteus* (Bot. Reg. t. 1567.) is especially deserving of attention, as the finest of all. To *Mimulus* I have also added several, among them the magnificent *M. cardinalis* (Hort. Soc. Trans. N. S. v. 2. p. 70. t. 3), an annual, three or four feet high, handsomer than *M. luteus; Clarckia elegans,* (Bot. Reg. t. 1575) is a pretty species, but hardly equal to *C. pulchella;* it grows to four or six feet, and has entire petals. It is to *Gilia, Collomia,*[2] *Phlox,* and *Heuchera,* that the greatest additions have been made: indeed they are too numerous to mention. Something is also done among the *Onagrarieæ.* Besides the new genus (*Zauschneria* of Presl) alluded to by De Candolle in his *Prodromus* (vol. II. p. 35), as exhibiting the flower of *Fuchsia* and the fruit of an *Epilobium,* I possess another new genus, and a multitude of *Œnotheras.* Also four undescribed kinds of *Pentstemon,* two of which far exceed any of the known species, and are shrubs; and among the *Papaveraceæ,* two, if not three, new genera.[3] One is frutescent, with a bifoliate calyx and four petals; it has the stamens of *Papaver* and the fruit of *Eschsholtzia,* with *entire leaves!* This

[1] See page 106 (in note).

[2] A splendid groupe, consisting of some of those that have since flowered in the Horticultural Society's Garden, is given in the Hort. Trans. N. S. v. 1. t. 18, and the dried specimens have afforded valuable materials for a revision of the whole Order by Mr. Bentham, in Bot. Reg. under t. 1622.

[3] See *Platystemon, Platystigma,* and *Dendromecon* of Mr. Bentham in Hort. Trans. N. S. v. 1. p. 465.

is my *Bichenovia*, a plant worthy of the Botanist to whom I dedicate it, as he is worthy of it.[1] The others are both annual and too curious for me to describe. By far the most singular and highly interesting plant here belongs to a genus, in some respects akin to *Salvia;* it is annual, and I have called it *Wellsia*, after Mr. Wells of Redleaf, in Kent (*Audibertia incana*, Benth. in *Bot. Reg. t.* 1469). This, with many others, I trust you may yet have the pleasure of describing from living specimens, as I have sent to London upwards of one hundred and fifty nondescript plants, which I hope will bloom next season. As I shall, if it please God, have the happiness of writing to you again shortly, I will, at present, only tell you of my projects. I am in daily expectation of a vessel from the Columbia, in which I shall embark to renew my labours in the North. Should she not arrive before the 10th of December, I will take my passage in an American vessel for the Sandwich Islands, where I shall not fail to endeavour to scale the lofty peaks of Mouna Roa or Mouna Kaah (the White or Snowy Mountain) in quest of Flora's treasures, and proceed to the North-West coast in the ensuing spring. I have met the Russian Authorities twice since I last wrote to you, and have received the utmost kindness from them. Two days ago I received a letter from Baron Wrangel, Governor of the Russian Possessions in America and the Aleutian Isles, full of compliments, and offering me all manner of assistance, backed by Imperial favour from the Court.[2] This nobleman is, as you are well aware, the Captain Parry of Russia, keenly alive to the interests of Science, and anxious to assist, in every way, those who labour in this field.

Since I began this letter, Dr. Coulter, from the Central States of the Republic of Mexico, has arrived here, with the intention of taking all he can find to De Candolle at Geneva. He is a man eminently calculated to work, full of zeal, very amiable, and I hope may do much good to Science. As a salmon-fisher he is superior even to Walter Campbell, of Islay, Esq., the Izaak Walton of Scotland; besides being a beautiful shot with a rifle, nearly as successful as myself! And I do assure you, from my heart, it is a *terrible pleasure* to me thus to meet a really good man, and one with whom I can talk of plants.[3]

River Columbia, Oct. 23, 1832.

Your truly welcome and highly-prized letter of Oct. 10, 1830, I had the pleasure to receive from Captain Charlton, our Consul at the Sandwich Islands, on my arrival at that place from the coast of California in August last. I esteem this mark of your regard as not the least of the many favours you have shown me. It affords me sincere delight to hear of the health of your family, and the great progress you have made in your publications, the improvement of the apartments in which you keep your collections, and the prodigious increase of your Herbarium. I carry your letter about in my note-book, and when on my walks by the side of some solitary creek, the idea not unfrequently occurs to me, that I may have overlooked some part of it, out comes your epistle for another perusal.—Letters are indeed rare things to me in this part of the world.

I have had no opportunity of writing to you since last year by any conveyance that might be considered safe. I did so from Montérey, in Upper California, in October 1831, and sent it by way of Mexico, under the care of our Consul at the Port of San Blas; there I detailed to you the extent of my travels in that territory, and the progress of my collections, as well as gave

[1] Dendromecon rigidum, Benth. and Hook. *Ic. Plant.* t. 37.

[2] This nobleman had been, some little time previously, made acquainted with Mr. Douglas' mission through the kindness of our valued friend, Dr. Fischer, of St. Petersburgh, as well as that of the Imperial Minister in London. The same subject is alluded to in a succeeding letter.

[3] Dr. Coulter has, some time ago, returned to this country, with, we believe, a most extensive Herbarium, formed in Mexico and California. The living *Cacti* which he sent from the former country to Professor De Candolle of Geneva, and to Mr. Mackay of the Dublin College Botanic Garden, are particularly interesting.

you a brief notice of the country. This letter I hope you would receive about New Year's Day, 1832.[1] The Hudson Bay Company's vessel did not arrive on the coast of California in November, as had been expected, which, in some measure, frustrated my projects. No opportunity having offered for proceeding, either to the Columbia or the Sandwich Islands in the winter or spring of last year. I continued to consider California *as still new to me,* and set to work a second time, finding new plants, and drying better specimens of those which I formerly possessed. I think that I added not less than one hundred and fifty undescribed species this year, including some new genera, which will bring up the entire amount of flowering plants to scarcely less than seven thousand distinct species. I might have effected more; but being in constant dread of a vessel arriving, and sailing without me, I could not venture to be absent more than fifteen or twenty days at a time from the coast; however, as I did my best, I try to feel content.

I will now mention another new *Pinus* to you (*P. venusta*), which I discovered last March, on the high mountains of California (you will begin to think that I manufacture Pines at my pleasure). As my notes are not at hand, I must describe from memory.

Leaves solitary, two-ranked, rigid, sharp-pointed, green above, glaucous beneath. *Cone* cylindrical, three to four inches long, and four to six inches round, erect; *scales* orbicular, deciduous (like those of *P. balsamea*), with an entire bractea or appendage between the scales, exserted to three or four inches and a half! When on the tree, being in great clusters and at a great height withal, these cones resemble the inflorescence of a *Banksia,* a name which I should have liked to give to the species, but that there is a *Pinus Banksii* already. This tree attains a great size and height, and is, on the whole, a most beautiful object. It is never seen at a lower elevation than six thousand feet above the level of the sea, in latitude 36°, where it is not uncommon.

I saw for a second time, and in a new habitat, *Pinus Lambertiana,* more southerly on the mountains of Santa Lucia, in Upper California. Its cones were in fine condition, though perhaps a little too young and somewhat longer than those I had discovered further to the North in 1826. The timber in this new situation is the largest of all, but by no means so fine as that in the 43°, and 45° of N. latitude, where the temperature is doubtless more congenial to it. I have a host of new and beautiful plants; among them a fine perennial species of *Delphinium, D. cardinalis,* with flowers as fine as those of *Lychnis fulgens,* and seven undescribed kinds of *Calochortus,* which make that noble genus to consist, in all, of twelve species [including *Cyclobothrya.*—Ed.].

From the Sandwich Islands, I shipped on board the Sarah and Elizabeth, a South-Seaman of London, and bound for that port, nineteen large bundles of dry plants, in two chests, together with seeds, specimens of timber, &c. The Captain, a worthy little man, placed these articles in his own cabin, which gives great relief to my mind as to their safety. I have written to the Horticultural Society of London (should such exist), requesting the Council to permit four of the bundles of dried plants, destined "for Dr. Hooker of Glasgow," to be despatched without delay, and further "begging that they will permit me to transfer the publication of each and all these plants, saving those which the Society may consider as coming within their plans, to that gentleman, either for an Appendix to his *Flora Boreali-Americana,* or in any other works in which he may be engaged. No one is more able and willing to do the Society justice, while such a proceeding would be peculiarly gratifying to me."[2]

[1] This, the letter immediately preceding, did not arrive till April.

[2] I need scarcely say that this generous wish on the part of poor Douglas, has been to the fullest extent complied with, by the Horticultural Society; and the merits of this zealous Naturalist will be yet more evident, when I shall lay the account of them before the public, in the "*Companion to the Botanical Magazine.*" The materials are in a considerable state of

I have still at Fort Vancouver a good bundle of plants, perhaps about seventy species, which I shall try to send, through Mr. Garry, overland this spring, for publication, with *Mosses* and *Sea-weeds*, so that your *Flora* may be as complete as possible. At the Sandwich Islands a violent rheumatic fever prevented me from venturing at all to the hills during my short stay, and I sat and fretted enough about it! I have indeed had some hard work since I quitted England, of which I occasionally feel the effects, particularly in cold weather. Anxious that no time should be lost, I sailed from Montérey for those islands in an American vessel of forty-six tons burden! and had a passage of only nineteen days. What would have been thought, forty years ago, of passing over more than half of the great basin of the Pacific in such a craft? If steam-boats and rail-roads are not in our way, we, poor wanderers, must take what offers, sometimes good and sometimes bad. On my way to this river, and not far from its entrance, I had the pleasure to meet my old ship the Eagle, and old friend, Lieutenant Grave, R. N., who handed me a parcel from Soho Square, containing the second and third parts of the *Flora Boreali-Americana!* Singular indeed it was that I should receive this, just in the nick of time, for had it not been for a *kind unfavourable wind*, which obliged my vessel to go considerably out of her way, I should have missed her, and of course lost the pleasure of a sight of the *Flora*. I cannot really express how much I am obliged to you for writing to me. If it were not for your letters, and the information they convey, I should be utterly without news, for nobody else has sent me any.

I left in California my friend Dr. Coulter, who will not, I trust, quit that country till he has accomplished every thing, for he is zealous and very talented. To De Candolle, who is his old tutor, he sends all his collections; and who can wonder at his giving him the preference? Dr. Coulter expects to be in England in the autumn of 1833; I have given him a letter of introduction to you.

River Columbia, Oct. 24, 1832.

This day brings me another proof of your goodness, for Dr. M'Loughlin, Director of the Hudson's Bay Company, as soon as he learned of my arrival, kindly sent down the river to me several packages, among which was your friendly letter of July, 1831. Every thing you say gives me infinite pleasure, and adds to my comfort. I know not how to express my gratitude more earnestly than I did in the letter I wrote to you last night, to perform which I sat up till three o'clock this morning. I shall, without fail, replace your lost specimens of *Pines;* they were all plunged in warm water, that their leaves might not fall off, a mode I always adopt with Cape Heaths —but I fear they may have been heated or jumbled about in the vessel. I am glad you have set Mr. Drummond on his legs again, and hope he will do well.[1] I shall

forwardness, and figures of some have already appeared in my "Icones Plantarum."

Of the living plants of California, introduced to the Horticultural Society, besides the species of Pine, may be mentioned the following, which have flourished in the Chiswick Garden, or been published by Professor Lindley and others :—

PLANTS INTRODUCED BY MR. DOUGLAS, IN 1834.

Antirrhinum glandulosum.
Audibertia incana.
Bartonia aurea.
——— conferta.
Calochortus luteus.
——— splendens.
——— venustus.
Calliprora lutea.
Chelone centranthifolia.
Collinsia bicolor.
Cyclobothrya alba.
——— pulchella.
Douglasia nivalis.
Escholtszia crocea.
Eutoca viscida.
Garrya elliptica.
Gilia achilleæfolia.
—— coronopifolia.
—— tenuifolia.
—— tricolor.
Godetia lepida.
——— rubicunda.
——— venosa.
Lasthenia Californica.
Lasthenia glabrata.
Leptosiphon androsaceus.
——— densiflorus.
Limnanthes Douglasii.
Lupinus albifrons.
——— densiflorus.
——— latifolius.
——— leptophyllus.
——— nanus.
——— rivularis.
Nemophila insignis.
Œnothera densiflora.
——— tenella, var. albiflora.
Oxyura chrysanthemoides.
Phacelia tanacetifolia.
Pentstemon digitalifolium.
——— staticæfolium.
Platystemon Californicum.
Psoralea macrostachya.
Ribes speciosum (first, however, introduced by Mr. Collie.)
Trifolium fucatum.
Triteleia laxa.

[1] This alludes to the botanical journeys of Mr. Drummond in Louisiana and Texas, of which an ac-

write to the Rev. Narcisse Duran, the Prefect of the Order in California, an amiable and learned man, who will receive him kindly, and do him the most signal service. I shall write likewise to Mr. Hartnel, an English gentleman, in whose house I lived at Montérey, who will also aid him. I may have an opportunity of addressing some of the Principals of the American Fur Company, to several of whom I am personally known; they are generally intelligent and kind-hearted men, much disposed to be useful. This I can easily do; for I am regarded by them as half an American, having spent so many years in the New World.

Mr. Garry is exceedingly kind to me: I have also received a long letter from Capt. Sabine, dated Charlemont Fort, Ireland, full of kindness. Nothing can be more gratifying to me than to be remembered by old friends after the lapse of so many months, and when so far apart. Capt. Sabine goes so far as to say, that he can suggest to me no improvement in the manner of taking my astronomical or other observations, or in the way of recording them. He has shown them to the excellent Capt. Beaufort, who also expressed his approbation of them, and has (I fear, too partially) done the same officially to Mr. Hay at the Colonial Office. Capt. Sabine feels, I am sensible, too true a regard for my welfare not to point out my faults, and as this letter adverts to none, I may take it for granted, I trust, that he is well pleased with me. I have received a copy of Capt. Beechey's book. I entertain a great respect for that gentleman, but I think he has been too severe on the Catholic Missionaries in California. Any man who can make himself well understood by them, either in Castilian or Latin, will discover very shortly that they are people who know something more than their mass-book, and who practise many benevolent acts, which are not a little to their credit, and ought to soften the judgment of the stranger, who has probably had more opportunity of seeing men and things than the poor priests of California. Their errors are the errors of their profession, and not of their hearts, and I thus make bold to say so, having had reason to know that the individuals in question are honourable exceptions to priests in general. I am no friend to Catholicism, still I should desire to maintain my own opinion without hurting the feelings of others.

I heard of M. Klotzsch from Mr. Ferdinand Deppe,[1] of Berlin, whom I had the pleasure to meet in California. Formerly M. Deppe devoted his time wholly to Natural History, Zoology in particular; but now he is partly engaged in mercantile pursuits. In Mr. Klotzsch's favourite department of Botany little has been done out of Europe, and I fear little can be effected until he, or some one of equal zeal and talent, will undertake a voyage for the express purpose—at least, we can only look for a *collection* from such a source.

What a blank we have in the department of sea-weeds! You must still look to Mr. Menzies as the main stay, though you will find some fine species in my collection from the coast of California. Fearing I may not have it in my power to visit the numerous groupes of islands, so particularly rich in this class of vegetables on the North-West parts of the continent, I have written to all friends, American as well as English, residing there, and requested them to collect every thing in the shape of sea-weed, and that I may put them to as little trouble as possible, I have told them simply to dry them in the sun. They can, like Mosses, be revived and put in order afterwards. Scarcely a Moss exists in California! But when we consider the excessive dryness of its climate, our surprize may cease. Perhaps no where else in the world is such drought felt, if we except the deserts of Arabia, Egypt, and the plains of Ispahan; and what we know of these coun-

count has already been given in the first volume of this Journal. It was at one time thought he might reach the Pacific from the Mississippi, by way of California. But it was otherwise ordained.

[1] Many of the new plants discovered by this gentleman in Mexico are published by Schlechtendal and Chamisso in the volumes of the "*Linnæa*;" the same work also contains some interesting accounts of his excursions.

tries on this point is vague and imperfect, the senses being generally the test. Frequently have I sunk the internal thermometer of Daniell's hygrometer many degrees below zero, until the ball of the instrument was clothed with hoar-frost, and not the smallest particle of moisture could, on the most accurate scrutiny, be detected! My Meteorological Journal is, I trust, complete, and should such be wanted, will furnish ample data for an essay on this beautiful country.

Not having received any letter from England, I cannot definitively state what will be the direction of my future journey. Should I receive no fresh orders, I shall, as I stated before leaving home, proceed to the northward of the Columbia, skirting the western flanks of the Rocky Mountains, as far as convenience and safety will allow, and endeavour to reach the sea to the westward, to some of the Russian Establishments, or return by the same route, as may appear most desirable. On this point I shall be able to inform you in my next.

I have had two most kind letters from Baron Wrangel, Governor of the Russian Territories in America, and of the Aleutian Islands, to whom I was made known through the Russian Minister at the Court of London. In his first he writes thus, which I know it will be pleasant to you to know, as it is highly agreeable to me:—"J'ai appris avec une vive joie vôtre intention de faire une tournée dans nos environs. Soyez sûr, Monsieur, que jamais visite ne m'a été plus agréable, et que des bras ouverts vous attendent à Sitka. Si vous avez l'intention de retourner en Europe, par la Sibérie, je puis vous assurer qu'au mois de Mai de l'année prochaine, vous pourrez commodement aller sur un de nos navires à Okotsk, où, d'après des nouvelles que je viens d'apprendre, on vous a dejà preparé un gracieux accueil." This is more than kind, and the facilities offered for May, 1832, of course hold good for ensuing years. This letter was accompanied by a copy of a volume published in 1829, Recueil des Actes de l'Académie de St. Petersbourg, containing some very interesting accounts of the Russian expeditions to Mount Ararat; also an outline of Mertens' labours with Capt. Lutke's Pendulum and Experiments made during his voyage. The Baron wrote me a second letter, and being fearful that I might not have received his first, took care to give me the same information, backed with additional assurances of his good will. I have had the advantage of seeing Cyrill Klebinkoff, Chief Director of the Russian-American Fur Company, an excellent man, who has great claims on my gratitude, as well as several Officers of the Imperial Navy. Indeed they seem to be a set of people whose whole aim is to make you happy. You have my best thanks for replying to Dr. Fischer of St. Petersburgh; I shall write to him when opportunity offers.

I have a great desire to become better acquainted with the vegetation of the Sandwich Islands, as I am sure much remains to be done there, and before quitting that country I made conditional arrangements with Capt. Charlton, our Consul, to aid me, should I return. This I shall earnestly endeavour to do. The Consul is a most amiable and excellent person. In *Ferns* alone, I think there must be five hundred species.

I will trouble you to offer my kind regards to my old friends, Mr. Murray and Dr. Scouler, and say to the latter that I have a tolerable collection of bones for him, but as I thought he would himself enjoy the job of cleansing them, I have only cut away the more fleshy parts, by which means, too, they hang better together. They consist of a *Sea Otter*, entire; *Wolves*, *Foxes*, *Deer*, a *Panther's head*, &c. I shall send them by the earliest opportunity. You may also tell him that human heads are now plentiful in the Columbia, a dreadful intermittent fever having depopulated the neighbourhood of the river; not twelve grown-up persons remain of those whom we saw when he and I were here together in 1825."

The following was a sort of postscript to the above letter, but addressed to a young

member of my family, who often had listened with delight to Mr. Douglas' well-told tales of his previous adventures in North-West America, and had caught something of the spirit of adventure from the narrator.

"Your kind letter, dated just two years ago gives me great satisfaction, as containing good accounts of the health and prosperity of yourself, brother, sisters, and parents. Mr. Klotzsch's method of preserving *Fungi*, as you detail it to me, appears very excellent;[1] that of scooping out the inside would, however, suit me better than the plan of boiling in tallow or grease till they are saturated; for, to tell you the truth, my dear young friend, such persons as myself, in a place like North-West America, commonly fry the Fungi in a little fat, if butter cannot be had, and then eat mushrooms, tallow, and all together! But I will follow your and Mr. Klotzsch's plan when I have it in my power.

"Your description of the late excursions to Ben Lomond and Killin delights me highly. I only wish I could have been of the party, whether to fish, shoot, or botanize. By this time I trust you are almost another Izaak Walton, whose book you should study diligently, if you ever would become a worthy brother of the angle. In California I had fine sport, both at fishing and hunting; the former principally in sea-fish, as those of the river are few and small. This mighty stream (the Columbia) is incomparably the noblest in the world for *Salmon, Trout,* and *Sturgeon,* whether for quality or abundance. But in the Sandwich Islands, my dear boy, the natives *domesticate* their fish! They catch in the sea, when about two inches long, two kinds of *Mullet*, the *Grey* and the *White*, with another fish of great delicacy, called in their tongue *Ava*, and remove them to large ponds of brackish or partly salt water, where they are suffered to remain a few weeks, and ultimately deposited in tanks of fresh water, where they grow exceedingly large and fine, and are taken out for use at the pleasure of the owner. Thus you see these fellows are no despicable fishers.

"You may tell your little brother, (who wondered that I could bear to go to sea, as there were Cockroaches in all ships,) that I feel now a mortal antipathy, more even than he, if possible, to these insects; for having made a great number of observations in the Sandwich Islands, the vile Cockroaches ate up all the paper, and as there was a little oil on my shoes, very nearly demolished them too!

I have never seen the Aurora Borealis, about which you inquire, particularly splendid, except occasionally near Hudson's Bay; but as I hope shortly to go so far to the North, as to see this phenomenon in all its magnificence, you shall perhaps hear of it by my next letter.

"I trust we may yet have a fine jaunt to the Highlands together, perhaps in the summer of 1835."

By the time I reach Fort Vancouver, probably I may receive another letter from you. I have only a few hours left, in which to write and thank Captains Beaufort and Sabine for all their goodness. Therefore be pleased to pardon this hasty epistle, and allow me to say again how greatly I feel obliged and gratified by this last token of your esteem, and to permit me to assure you that it is not bestowed on one who is incapable of feeling and appreciating it.

Interior of the River Columbia,
lat. 48°, 5′ N., long. 119°, 23′ W. April 9, 1833.

Early last November, by the arrival of the annual express across the continent at Fort Vancouver, I had the great pleasure to receive your very kind and truly welcome letter of May, 1832, accompanied by a memoir of the late Capt. Carmichael, and a notice of the late Mr. Barclay, from the Botanical Miscellany. I cannot tell you with what fervour I peruse your letters, especially at this distance from home. When I tell you that your epistle was the only one I had received for a whole year, saving a short one from the excellent Mr

[1] For an account of M. Klotzsch's mode of preserving Fungi, see Botanical Miscellany, v. 2. p. 159. t. 83.

Garry, who most punctually forwarded your parcel to me, you will perceive how very precious a thing a letter is to me now-a-days.

Botany and ornamental gardening have sustained a great loss in the death of Mr. Barclay; the more to be regretted, as no one seems to take that place which he held for so many years with honour to himself and advantage to the Science as one of its most liberal patrons. Last October, from the entrance of the Columbia River, by the last vessel which sailed for England, commanded by my excellent friend, J. E. Grave, Lieut. R. N., I wrote to you at some length, and then mentioned that I had shipped in the Sandwich Islands, on board the Sarah of London, a South-Seaman, bound for London direct, the whole of my Californian collection. This vessel sailed from the Island of Woahoo on the 8th of September. Since I wrote to you, the season being winter, I have little new to communicate: during the interval I have made a journey, as I proposed, North of the Columbia, to New Georgia, and a most laborious one it was. My object was to determine the position of the Head Lands on the coast, and the culminating points of the many prodigiously high snowy peaks of the Interior, their altitudes, &c., and as I was favoured with exceedingly fine clear weather, this was effected much to my satisfaction. On this excursion I secured about two hundred species of *Mosses;* but as I am rather ignorant of this tribe, there may be a few more or less: certain it is, however, that there are many fine kinds that are totally unknown to me; and perhaps even you may find some of them new. I have also some interesting *Fuci* from Puget's Sound, collected on the same journey, three of which are decidedly not in Mr. Turner's work, and very noble species they are. I have bespoken the services of all the Captains on the North-West coast, to bring me all sorts of sea-weeds, simply coiled up, dried, and put in a bag. This winter has been drier, but far more severe than the preceding season. The Columbia was closed with ice for four weeks at Menzies' Island, where it rather exceeds a mile in breadth, the thermometer indicating 22° of Fahrenheit, which is bitterly cold for the shores of the Pacific, in the parallel of 45. This gave me an excellent opportunity of multiplying my astronomical observations, on the angular distance between the moon's limb and the sun; the planets Venus, Mercury, Saturn, and Mars, and the fixed stars; not less than eight thousand observations in about six hundred sets, separately computed, for the purpose of ascertaining the absolute longitude of Fort Vancouver. Besides, I observed the beautiful eclipse of the moon on the night of January the 5th of this year, with many of the eclipses of Jupiter's satellites. Indeed my whole skill was exerted on these operations, in order to obtain their position with the greatest accuracy, as all my chronometric longitudes are reduced to that meridian. I merely mention these things that you may not tax me with idleness, a character with which I am charged by the Londoners, and perhaps more deservedly in that great metropolis than elsewhere. I hope that you have not finished the fine Order *Coniferæ* in the *Flora Boreali-Americana,* that you may include the *Pines* discovered in my late journeys, viz. *Pinus venusta, Sabini,* and *grandis.*

I quitted the ocean on the 19th of March, and followed the course of the river to this spot, picking up a few of the early-flowering plants, and better specimens of others which I had already possessed: among them are some novel species of *Platyspermum, Thysanocarpus,* and *Ranunculus:* a new *Phlox,* and a few Mosses. The disparity of climate between this point and the coast is very striking, though the difference of latitude be only 3°, and of longitude 6°. There, in the middle of March, many plants were in bloom; while here last night we had a new fall of snow of some depth, and the ground is still speckled with old snow.

I proceed to give you a short sketch of my intended movements this year.

As soon as the season permits, which I trust will be in a few days, I shall leave this spot for the northward, travelling some-

times in canoes, or on horseback, but far more generally on foot. The country is mountainous and very rugged, the rivers numerous, and there are not a few lakes of considerable extent. Perhaps I shall cross Mackenzie's track, at Fraser's River (called the Columbia by that great traveller), in about long. 122° West, and proceed northward, among the mountains, as far as I can do so with safety, and with the prospect of effecting a return. The country is certainly frightful; nothing but prodigious mountains to be seen: not a deer comes, say the Indians, save once in a hundred years—the poor natives subsist on a few roots. My outfit is five pounds of tea, and the same quantity of coffee, twenty-five pounds of sugar, fifteen pounds of rice; and fifty pounds of biscuit: a gallon of wine, ten pounds of powder and as much of balls, a little shot, a small silk fishing-net, and some angling tackle, a tent, two blankets, two cotton and two flannel shirts, a handkerchief, vest, coat, and a pair of deer-skin trousers (not those kindly presented to me by Dr. Gillies, which, by repeated exposure to rain, shrunk so much that I was reluctantly obliged to give them away), two pairs of shoes, one of stockings, twelve pairs of mocassins, and a straw hat. These constitute the whole of my personal effects; also a ream and a-half of paper, and instruments of various kinds; my faithful servants, several Indians, ten or twelve horses, and my old terrier, a most faithful, and now, to judge from his long grey beard, venerable friend, who has guarded me throughout all my journies, and whom, should I live to return, I mean certainly to pension off, on four pennyworth of cat's-meat per day!

I am most anxious that you should know what I see and do on this important journey, and as it may so turn out that I shall never have the pleasure of meeting you more, I intend, God willing, to commence writing a little to you on the very first evening of my journey, which is fixed for the 18th, and continue thus to condense, from time to time, the substance of my notes, putting down whatever may appear most important and interesting to me.

Fever still clings to the native tribes with great obstinacy, and not a few of the people of the Hudson's Bay Company have suffered very severely from it. Only three individuals out of one hundred and forty altogether escaped it, and I was one of that small number. Thank God, I never was in better health, and could I but have a few moments with you, I might add, in excellent spirits. Even the employment of writing to you, tends to enliven my mind. It is singular, that while my left eye is become infinitely more delicate and clear in its power of vision, the sight of my right eye is utterly gone; and, under every circumstance, it is to me as dark as midnight. If I look through a telescope or microscope, I generally see objects pretty well at a short distance, but the least fatigue brings on a *doubling* of the object, with a surrounding vapory haze, that soon conceals every thing. These results were owing to an attack of ophthalmia, in 1826, followed by snow-blindness, and rendered irretrievable by the scorching heat of California. I use purple goggles to diminish the glare of the snow, though most reluctantly, as every object, plants and all, is thus rendered of the same colour.

If you happen to be acquainted with Mr. James Wilson,[1] of Edinburgh, brother to the celebrated Professor of that name, I beg you will offer him my sincere respects, aud say that I have a few things for his "Illustrations," and a fine collection of birds for the College Museum.

Woahoo, Sandwich Islands,
May 6th, 1834.

I am two letters in your debt; for last autumn, at the Columbia River, I had the great pleasure to receive, through Dr. Meredith Gairdner,[2] a very long letter from you: and

[1] Mr. Wilson was, at this time, engaged in publishing his beautiful Zoological Illustrations. Ed.

[2] This accomplished gentleman, together with Mr Tolmie, one of my most zealous Botanical students, I had the pleasure of recommending to medical appointments in the Hudson Bay Company's possessions

the same happiness was conferred on me on the 16th of April, by your last, which was exactly a year old, and in which you mention having addressed me just two months previously. I imagine this last letter must have been sent by Captain Back, or the annual express of the Hudson's Bay Company; but I had left the sea before the express arrived.

My meeting with Dr. Gairdner afforded me heart-felt satisfaction, not only because he is a most accomplished and amiable young gentleman, devotedly attached to Natural History, and warmly recommended by you, but also because he told me of your health, and that of your family: the additions to your Herbarium, &c. I endeavoured to show him the attentions to which every friend of yours is justly entitled at my hands, and only regret that our time together was so short; for he is a person whom I highly respect. Mr. Tolmie had quitted the Columbia for the North-West coast before I arrived, and thus deprived me of the pleasure of seeing an old student of yours. I wrote to him twice, indicating those parts of the country which promise to yield the best harvest to the Naturalist, and particularly requesting his attention to the sea-weeds; but have not heard from him since, nor indeed at any time. I much regret not having seen this gentleman, for I could have told him many things useful for a young man entering this country as a Botanist or traveller to know. However, I explained them all to Dr. Gairdner.

You will probably enquire why I did not address you by the despatch of the ship to Europe last year. I reached the sea-coast greatly broken down, having suffered no ordinary toil, and, on my arrival, was soon prostrated by fever. My last letter to you was written from the interior of the Columbia, and bore date about the middle of April, 1833 (last year), just before starting on my northern journey. Therein I mentioned my intention of writing a few lines to you daily, which I did, up to the 13th of June, a most disastrous day for me, on which I lost, what I may call, my all! On that morning, at the Stony Islands of Fraser's River (the Columbia of M'Kenzie,—see the map in his 4to. edition), my canoe was dashed to atoms, when I lost every article in my possession, saving an astronomical journal, book of rough notes, charts, and barometrical observations, with my instruments. My botanical notes are gone, and, what gives me most concern, my journal of occurrences also, as this is what can never be replaced, even by myself. All the articles needful for pursuing my journey were destroyed, so that my voyage for this season was frustrated. I cannot detail to you the labour and anxiety this occasioned me, both in body and mind, to say nothing of the hardships and sufferings I endured. Still I reflect, with pleasure, that no lives were sacrificed. I passed over the cataract and gained the shore in a whirlpool below, not however by swimming, for I was rendered helpless, and the waves washed me on the rocks. The collection of plants consisted of about four hundred species—two hundred and fifty of these were mosses, and a few of them new. This disastrous occurrence has much broken my strength and spirits. The country over which I passed was all mountainous, but most so towards the Western Ocean:—still it will, ere long, be inhabited. I have written to Mr. Hay, Under Secretary of State, respecting the boundary line on the Columbia, as the American government is anxious to obtain a footing there.[1]

the North-West coast of America. The latter gentleman is stationed at Fort M'Loughlin, in Millbank Sound, N. lat. 52.

[1] The following are some further particulars of this disastrous voyage, given to me by Archibald M'Donald, Esq., a gentleman in the Hudson Bay Company's service, who visited Scotland, early in the year 1835:—

"Agreeably to your wish, Sir, I proceed to commit something to paper, connected with our friend Douglas, in case it may assist the design which his friends entertain of laying something before the public, prior to Mr. Douglas' own return to England. It is very little that I can say, beyond what is expressed in his own letters; but, little as it is, I have thought it a good plan to accompany it with a rough topographical sketch of the country, to which

After this misfortune, in June, I endeavoured, as far as possible, to repair my losses, and set to work again; and I hope some good new species were obtained for the *Flora Boreali-Americana,* which I am very anxious should reach you without delay. It it more than probable that I may have the pleasure of presenting these to you myself, say in March next, as it is my intention to return to England by the very first opportunity; and I hope this small collection may give you some satisfaction, as it is all I can now offer you from North-West America. It reconciles me somewhat to the loss, to reflect that you now have friends in that country, who will probably make up the deficiency. I have given Dr. Gairdner my notes on some more new species of *Pinus.* This gentleman, and Mr. Tolmie, will have a good deal to contend with. Science has few friends among those who visit the coast of North-West America, solely with a view to gain. Still with such a person as Mr. M'Loughlin on the Columbia, they may do a great deal of service to Natural History.

I sailed from the Columbia in November last, in the Hudson Bay Company's vessel, which visited these islands, touching on the way at San Francisco, where I made a short stay, but did nothing in the way of Botany. I arrived here on the 23rd of December, and, after spending Christmas Day with two English ladies, the wife of our Consul, Mr. Charlton, and her sister, I started on the 27th for the island of Hawaii, which I reached on the 2nd of January, 1834. You know I have long had this tour in contemplation, and, having spent three winter months in botanizing here, I proceed to give you a short notice of my proceedings.

The view of this most interesting island, from the sea, is sublime indeed; combining the grand, sweet, and beautiful, in a most remarkable degree. For two thousand five hundred feet above the level of the sea, the *Banana, Sugar Cane, Coffee, Pandanus, Bread Fruit,* &c. grow in the greatest perfection. Then comes a thickly timbered country as high as eight thousand feet, and for three thousand seven hundred feet more, a space covered with short verdure; after which the reign of Flora terminates. I made a journey to the summit of *Mouna Kaah,* which occupied fourteen days, and found it only thirteen thousand eight hundred and fifty-one English feet above the sea; a height, you may observe, much less than has been ascribed to this mountain by early travellers. In this expedition I amassed a most splendid collection of plants, principally Ferns and Mosses: many, I do assure you, truly

you can refer to the relative directions of places, though not for a correct scale of distances.

"On his arrival in the country, May, 1830, Mr. Douglas ascended the Columbia for some distance, returning in September, when he soon took his passage in one of our vessels to California. There he remained till the autumn of 1832, and, in October of that year, returned to Fort Vancouver, by way of the (Sandwich) islands, and spent the winter in that vicinity, in the most advantageous way he could, principally in Astronomical pursuits.

"Early in March, 1833, he met me at Puget's Sound, and we returned together to Fort Vancouver, on the 20th, of the same month, when he embarked with our people, who were crossing over to Hudson's Bay. He landed at Oakanagan, whence he proceeded with the cattle party to Thompson's River, Alexandria, and Upper Caledonia. At Stuart's Lake he found one of the Company's officers preparing to set out on an exploring expedition, down Simpson's River, which falls into the Pacific, two or three degrees North of M'Kenzie's small river, and was much disposed to accompany him: but fearing they could not reach the sea, or any of our settlements on the coast, and would in that case lose time, and be disappointed in other projects he had in view, he did not join the party. With his man, Johnson, he shipped himself in a small bark canoe down to Fort George; there he remained a day or two with Mr. Linton, and, on the second day after he had commenced descending the stream, he experienced the disaster, which he communicated in a letter to yourself. From Alexandria Mr. Douglas got back to Thompson's River, and Oakanagan, by the same route that he went, and with the same means that he had from our people in Spring. At Oakanagan he took two Indian canoes, and, when half-way down to Walla-wallah, on the 14th of July, met Mr. Conolly, of New Caledonia, and myself, on our way up the river, with supplies for the Interior. He continued some days at Walla-wallah, with Mr. Pambrun, making occasional journies to the Blue Mountains, and finally attempted the ascent of Mount Hood. In the month of September, 1833, I received a letter from him, stating that he was on the eve of sailing again for the Sandwich Islands.

"ARCHIBALD M'DONALD."

"Edinburgh, 20th January, 1835."

beautiful, and worthy to range with the gigantic species collected by Dr. Wallich. Of Ferns alone I have fully two hundred species, and half as many Mosses; of other plants comparatively few, as the season is not yet good for them, nor will be so, until after the rains. On my return, I must consult with you on the best mode of publishing the plants of these islands.

I also visited the summit of *Mouna Roa*, the *Big* or *Long Mountain*, which afforded me inexpressible delight. This mountain, with an elevation of thirteen thousand five hundred and seventeen feet, is one of the most interesting in the world. I am ignorant whether the learned and venerable Menzies ascended it or no, but I think he must have done so, and the natives assert that this was the case. *The Red-faced Man, who cut off the limbs of men, and gathered Grass,* is still known here; and the people say that he climbed Mouna Roa. No one, however, has since done so, until I went up a short while ago. The journey took me seventeen days. On the summit of this extraordinary mountain is a volcano, nearly twenty-four miles in circumference, and at present in terrific activity. You must not confound this with the one situated on the flanks of Mouna Roa, and spoken of by the Missionaries and Lord Byron, and which I visited also. It is difficult to attempt describing such an immense place. The spectator is lost in terror and admiration at beholding an enormous sunken pit (for it differs from all our notions of volcanos, as possessing cone-shaped summits, with terminal openings), five miles square of which is a lake of liquid fire, in a state of ebullition, sometimes tranquil, at other times rolling its blazing waves with furious agitation, and casting them upwards in columns from thirty to one hundred and seventy feet high. In places, the hardened lava assumes the form of gothic arches in a colossal building, piled one above another in terrific magnificence, through and among which the fiery fluid forces its way in a current that proceeds three miles and a quarter per hour, or loses itself in fathomless chasms at the bottom of the cauldron. This volcano is one thousand two hundred and seventy-two feet deep; I mean down to the surface of the fire; its chasms and caverns can never be measured. Mouna Roa appears, indeed, more like an elevated Table-land than a mountain. It is a high broad dome, formed by an infinitude of layers of volcanic matter, thrown out from the many mouths of its craters. Vegetation does not exist higher than eleven thousand feet; there is no soil whatever, and no water. The lava is so porous, that, when the snow melts, it disappears a few feet from the verge, the ground drinking it up like a sponge. On the higher parts grow some species of *Rubus, Fraseria, Vaccinium,* and some *Junci.*

I visited also the volcano of Kirauea, the lateral volcano of Mouna Roa; it is nearly nine miles round, one thousand one hundred and fifty-seven feet deep, and is likewise in a terrific state of activity.

I go immediately to Hawaii to work on these mountains. May God grant me a safe return to England. I cannot but indulge the pleasing hope of being soon able, in person, to thank you for the signal kindness you have ever shown me. And really were it only for the letters you have bestowed on me during my voyage, you should have a thousand thanks from me.

I send this, under cover, to Captain Beaufort, to whom I have written respecting some of my astronomical observations; as also to Captain Sabine.

As already mentioned, the only Journal of Mr. Douglas' Second Expedition, which has reached this country, is that commencing with his departure from the Columbia, including the voyage to the Sandwich Islands, and the ascent of Mouna Roa. From this, with the loan of which we have been favoured by its possessor, Mr. John Douglas, we make the following extracts:—

MR. DOUGLAS' VOYAGE FROM THE COLUMBIA TO THE SANDWICH ISLANDS, AND THE ASCENT OF MOUNA ROA.

On Friday, the 18th of October, 1833, we quitted Cape Disappointment, in the

Columbia River, and, after encountering much variety of weather, and many heavy baffling gales, anchored off Point de los Reyes on the 4th of November, and remained there till the 28th of the same month, our attempts to beat out of the Harbour of Sir Francis Drake having proved, several times, ineffectual. On the 29th, I accompanied Mr. Finlayson in a small boat to Whaler's Harbour, near the neck of the bay, which leads up to the hill of San Rafaele, the highest peak in the immediate vicinity of the port. We landed at Mr. Read's farm-house, placed on the scite of an old Indian camp, where small mounds of marine shells bespeak the former existence of numerous aboriginal tribes. A fine small rivulet of good water falls into the bay at this point. Returning the same afternoon, we cleared the Punta de los Reyes, on the 30th, and, descrying the mountain of St. Lucia, South of Montérey, at a distance of forty or fifty miles, steered southward for the Sandwich Islands. The island of Mauai was indistinctly seen, at sun-set, of the 21st of December, forty-two miles off; and, on the 22nd, Woahu lay ten miles due West of us. Having quitted the Harbour of Fair Haven, in Woahu, on Friday, the 27th, in an American schooner, of sixty tons, she proved too light for the boisterous winds and heavy seas of these channels, and we were accordingly obliged to drop anchor in Rahaina Roads, for the purpose of procuring more ballast. An American Missionary, Mr. Spaulding, having come on board, I accompanied him on shore, to visit the school, situated on the hill side, about five hundred feet from the shore, and returned to the ship at night. On Tuesday, the 31st of December, we stood in for the island of Hawaii, and saw Mouna Kuāh very clearly, a few small stripes of snow lying only near its summit, which would seem to indicate an altitude inferior to that which has been commonly assigned to this mountain.

My object being to ascend and explore Mouna Kuāh, as soon as possible, I started on the 7th January, 1834, and, after passing for rather more than three miles over plain country, commenced the ascent, which was however gradual, by entering the wood. Here the scenery was truly beautiful. Large timber trees were covered with creepers and species of *Tillandsia*, while the *Tree Ferns* gave a peculiar character to the whole country. We halted and dined at the Saw Mill, and made some barometrical observations, of which the result is recorded, along with those that occupied my time daily during the voyage, in my journal. Above this spot the *Banana* no longer grows, but I observed a species of *Rubus* among the rocks. We continued our way under such heavy rain, as, with the already bad state of the path, rendered walking very difficult and laborious; in the chinks of the lava, the mud was so wet that we repeatedly sunk in it, above our knees. Encamping at some small huts, we passed an uncomfortable night, as no dry wood could be obtained for fuel, and it continued to rain without intermission. The next day we proceeded on our way at eight o'clock, the path becoming worse and worse. The large *Tree Ferns*, and other trees that shadowed it, proved no protection from the incessant rain, and I was drenched to the skin the whole day, besides repeatedly slipping into deep holes, full of soft mud. The number of species of *Filices* is very great, and towards the upper end of the wood, the timber trees, sixty or seventy feet high, and three to ten inches in circumference, are matted with Mosses, which, together with the *Tillandsias* and *Ferns*, betoken an exceedingly humid atmosphere. The wood terminates abruptly; but as the lodge of the cattle-hunter was still about a mile and a-half farther up the clear flank of the mountain, situated on the bank of a craggy lava stream, I delayed ascertaining the exact altitude of the spot where the woody region ends, (a point of no small interest to the Botanist,) until my return, and sate down to rest myself awhile, in a place where the ground was thickly carpeted with species of *Fragaria*, some of which were in blossom, and a few of

them in fruit. Here a Mr. Miles, part owner of the saw-mill that I had passed the day before, came up to me; he was on his way to join his partner, a Mr. Castles, who was engaged in curing the flesh of the wild cattle near the verge of the wood, and his conversation helped to beguile the fatigues of the road, for though the distance I had accomplished this morning was little more than seven miles, still the laborious nature of the path, and the weight of more than 60 lbs. on my back, where I carried my barometer, thermometer, book, and papers, proved so very fatiguing, that I felt myself almost worn out. I reached the lodge at four, wet to the skin, and benumbed with cold, and humble as the shelter was, I hailed it with delight. Here a large fire dried my clothes, and I got something to eat, though, unluckily, my guides all lingered behind, and those who carried my blanket and tea-kettle were the last to make their appearance. These people have no thought or consideration for the morrow; but sit down to their food, smoke and tell stories, and make themselves perfectly happy. The next day my two new acquaintances went out with their guns and shot a young bull, a few rods from the hut, which they kindly gave me for the use of my party. According to report, the grassy flanks of the mountain abound with wild cattle, the offspring of the stock left here by Capt. Vancouver, and which now prove a very great benefit to this island. A slight interval of better weather this afternoon afforded a glimpse of the summit between the clouds, it was covered with snow. At night the sky became quite clear, and the stars, among which I observed Orion, Canis minor, and Canopus, shone with intense brilliancy.

The next day the atmosphere was perfectly cloudless, and I visited some of the high peaks which were thinly patched with snow. On two of them, which were extinct volcanos, not a blade of grass could be seen, nor any thing save lava, mostly reddish, but in some places of a black colour. Though on the summit of the most elevated peak, the thermometer under a bright sun, stood at 40°, yet when the instrument was laid at an angle of about fifteen degrees, the quicksilver rose to 63°, and the blocks of lava felt sensibly warm to the touch. The wind was from all directions, East and West, for the great altitude and the extensive mass of heating matter completely destroy the Trade Wind. The last plant that I saw upon the mountain was a gigantic species of the *Compositæ* (*Argyrophyton Douglasii*, Hook. Ic. Plant. t. 75), with a column of imbricated, sharp-pointed leaves, densely covered with a silky clothing. I gathered a few seeds of the plants which I met with, among them a remarkable *Ranunculus*, which grows as high up as there is any soil. One of my companions killed a young cow just on the edge of the wood, which he presented me with, for the next day's consumption. Night arrived only too soon, and we had to walk four miles back to the lodge across the lava, where we arrived at eight o'clock, hungry, tired, and lame, but highly gratified with the result of the day's expedition.

The following morning proved again clear and pleasant, and every thing being arranged, some of the men were despatched early, but such are the delays which these people make, that I overtook them all before eight o'clock. They have no idea of time, but stand still awhile, then walk a little, stop and eat, smoke and talk, and thus loiter away a whole day. At noon we came up to the place where we had left the cow, and having dressed the meat, we took a part and left the rest hanging on the bushes. We passed to the left of the lowest extinct volcano, and again encamped on the same peak as the preceding night. It was long after dark before the men arrived, and as this place afforded no wood, we had to make a fire of the leaves and dead stems of the species of *Compositæ* mentioned before, and which, together with a small *Juncus*, grows higher up the mountain than any other plant. The great difference produced on vegetation by the agitated and volcanic state of this mountain is very distinctly marked. Here there is no line between the Pheno-

gamous and Cryptogamous Plants, but the limits of vegetation itself are defined with the greatest exactness, and the species do not gradually diminish in number and stature, as is generally the case on such high elevations.

The line of what may be called the Woody Country, the upper verge of which the barometer expresses 21,450 inch.; therm. 46° at 2 P. M., is where we immediately enter on a region of broken and uneven ground, with here and there lumps of lava, rising above the general declivity to a height of three hundred to four hundred feet, intersected by deep chasms, which show the course of the lava when in a state of fluidity. This portion of the mountain is highly picturesque and sublime. Three kinds of timber, of small growth, are scattered over the low knolls, with one species of *Rubus* and *Vaccinium*, the genus *Fragaria* and a few *Gramineæ*, *Filices*, and some alpine species. This region extends to bar. 20,620 inch.; air 40°, dew-point 30°. There is a third region, which reaches to the place where we encamped yesterday, and seems to be the great rise or spring of the lava, the upper part of which, at the foot of the first extinct peak, is bar. 20,010 inch.; air 39°.

At six o'clock the next morning, accompanied by three Islanders and two Americans, I started for the summit of the mountain; bar. at that hour indicated 20,000 inch. therm. 24°, hygr. 20°, and a keen West wind was blowing off the mountain, which was felt severely by us all, and especially by the natives, whom it was necessary to protect with additional blankets and great coats. We passed over about five miles of gentle ascent, consisting of large blocks of lava, sand, scoriæ, and ashes, of every size, shape, and colour, demonstrating all the gradations of calcination, from the mildest to the most intense. This may be termed the Table Land or Platform, where spring the great vent-holes of the subterranean fire, or numerous volcanos. The general appearance is that of the channel of an immense river, heaved up. In some places the round boulders of lava are so regularly placed, and the sand is so washed in, around them, as to give the appearance of a causeway, while in others, the lava seems to have run like a stream. We commenced the ascent of the Great Peak at nine o'clock, on the N. E. side, over a ridge of tremendously rugged lava, four hundred and seventy feet high, preferring this course to the very steep ascent of the South side, which consists entirely of loose ashes and scoriæ, and we gained the summit soon after ten. Though exhausted with fatigue before leaving the Table Land, and much tried with the increasing cold, yet such was my ardent desire to reach the top, that the last portion of the way seemed the easiest. This is the loftiest of the chimneys; a lengthened ridge of two hundred and twenty-one yards two feet, running nearly straight N. W. To the North, four feet below the extreme summit of the Peak, the barometer was instantly suspended, the cistern being exactly below, and when the mercury had acquired the temperature of the circumambient air, the following register was entered: at 11 hrs. 20 min.; bar. 18,362 inch.; air 33°; hygr. 0″ 5. At twelve o'clock the horizon displayed some snowy clouds; until this period, the view was sublime to the greatest degree, but now every appearance of a mountain-storm came on. The whole of the low S. E. point of the island was throughout the day covered like a vast plain of snow, with clouds. The same thermometer, laid on the bare lava, and exposed to the wind at an angle of 27°, expressed at first 37°, and afterwards, at twelve o'clock, 41°, though when held in the hand, exposed to the sun, it did not rise at all. It may well be conjectured that such an immense mass of heating material, combined with the influence of internal fire, and taken in connexion with the insular position of Mouna Kuāh, surrounded with an immense mass of water, will have the effect of raising the snow-line considerably, except on the northern declivity, or where sheltered by large blocks of lava, there was no snow to be seen; even on the top of the cairn, where the barome-

ter was fixed, there were only a few handsful. One thing struck me as curious, the apparent non-diminution of sound; not as respects the rapidity of its transmission, which is, of course, subject to a well-known law. Certain it is, that on mountains of inferior elevation, whose summits are clothed with perpetual snow and ice, we find it needful to roar into one another's ears, and the firing of a gun, at a short distance, does not disturb the timid Antelope on the high snowy peaks of N. W. America. Snow is doubtless a non-conductor of sound, but there may be also something in the mineral substance of Mouna Kuāh which would effect this.

Until eleven o'clock, the horizon was beautifully defined on the whole N. W. of the island. The great dryness of the air is evident to the senses, without the assistance of the hygrometer. Walking with my trousers rolled up to my knees, and without shoes, I did not know there were holes in my stockings, till I was apprised of them by the scorching heat and pain in my feet, which continued throughout the day, the skin also peeled from my face. While on the summit I experienced violent head-ache, and my eyes became blood-shot, accompanied with stiffness in their lids.

Were the traveller permitted to express the emotions he feels when placed on such an astonishing part of the earth's surface, cold indeed must his heart be to the great operations of Nature, and still colder towards Nature's God, by whose wisdom and power such wonderful scenes were created, if he could behold them without deep humility and reverential awe. Man feels himself as nothing—as if standing on the verge of another world. The death-like stillness of the place, not an animal nor an insect to be seen—far removed from the din and bustle of the world, impresses on his mind with double force the extreme helplessness of his condition, an object of pity and compassion, utterly unworthy to stand in the presence of a great and good, and wise and holy God, and to contemplate the diversified works of His hands!

I made a small collection of geological specimens, to illustrate the nature and quality of the lavas of this mountain, but being only slightly acquainted with this department of Natural History, I could do no more than gather together such materials as seemed likely to be useful to other and more experienced persons. As night was closing and threatening to be very stormy, we hastened towards the camp, descending nearly by the same way as we came, and finding my guide Honori and the other men all in readiness, we all proceeded to the edge of the woody region, and regained the lodge, highly gratified with the result of this very fatiguing day's excursion. Having brought provision from the hill, we fared well.

January the 13th.—The rain fell fast all night, and continued, accompanied by a dense mist, this morning, only clearing sufficiently to give us a momentary glimpse of the mountain, covered with snow down to the woody region. We also saw Mouna Roa, which was similarly clothed for a great part of its height. Thankful had we cause to be that this heavy rain, wind, and fog did not come on while we were on the summit, as it would have caused us much inconvenience, and perhaps danger.

The same weather continuing till the 15th, I packed up all the baggage, and prepared to return. It consisted of several bundles of plants, put into paper and large packages tied up in Coa baskets, which are manufactured from a large and beautiful tree, a species of *Acacia*, of which the timber resembles mahogany, though of a lighter colour, and is beautiful, and said to be durable: also some parcels of geological specimens, my instruments, &c. At seven A. M. I started, having sent the bearers of my luggage before me, but I had hardly entered the wood by the same path as I took on my ascent, when the rain began to fall, which continued the whole day without the least intermission; but as there was no place suitable for encamping, and the people, as usual, had straggled away from one another, I resolved to proceed. The path was in a dreadful state,

numerous rivulets overflowed it in many places, and, rising above their banks, rushed in foam through the deep glens, the necessity for crossing which impeded my progress in no slight degree. In the low places the water spread into small lakes, and where the road had a considerable declivity, the rushing torrent which flowed down it, gave rather the appearance of a cascade than a path. The road was so soft that we repeatedly sunk to the knees, and supported ourselves on a lava block, or the roots of the trees. Still, violent as was the rain, and slippery and dangerous the path, I gathered a truly splendid collection of Ferns, of nearly fifty species, with a few other plants, and some seeds, which were tied up in small bundles, to prevent fermentation, and then protected by fresh Coa bark. Several beautiful species of Mosses and Lichens were also collected; and spite of all the disadvantages and fatigue that I underwent, still the magnificence of the scenery commanded my frequent attention, and I repeatedly sate down, in the course of the day, under some huge spreading Tree-Fern, which more resembled an individual of the Pine than the Fern tribe, and contemplated with delight the endless variety of form and structure that adorned the objects around me. On the higher part of the mountain, I gathered a Fern identical with the *Asplevium viride* of my own native country, a circumstance which gave me inexpressible pleasure, and recalled to my mind many of the happiest scenes of my early life.

In the evening I reached the saw-mill, when the kind welcome of my mountain-friend, Mr. Mills, together with a rousing fire, soon made me forget the rain and fatigues of the day. Some of the men had arrived before me, others afterwards, and two did not appear till the following day, for having met with some friends, loaded with meat, they preferred a good supper to a dry bed. My guide, friend, and interpreter, Honori, an intelligent and well-disposed fellow, arrived at seven, in great dismay, having, in the dark, entered the river a short distance above a chain of cataracts, and to avoid these, he had clung to a rock till extricated by the aid of two active young men. Though he escaped unhurt, he had been exposed to the wet for nearly ten hours. A night of constant rain succeeded, but I rested well, and after breakfast, having examined all the packages, we quitted the saw-mill for the bay, and arrived there in the afternoon, the arrangement and preservation of my plants affording me occupation for two or three days. It was no easy matter to dry specimens and papers during such incessantly rainy weather. I paid the whole of the sixteen men who had accompanied me, not including Honori and the king's man, at the rate of two dollars, some in money and some in goods: the latter consisted of cotton cloth, combs, scissors, and thread, &c.; while to those who had acquitted themselves with willingness and activity, I added a small present in addition. Most of them preferred money, especially the lazy fellows. The whole of the number employed in carrying my baggage and provisions, was five men, which left eleven for the conveyance of their own *Tapas* and food. Nor was this unreasonable, for the quantity of *Poe* which a native will consume in a week, nearly equals his own weight! a dreadful drawback on expedition. Still, though the sixteen persons ate two bullocks in a week, besides what they carried, a threatened scarcity of food compelled me to return rather sooner than I should have done, in order that the Calabashes might be replenished. No people in the world can cram themselves to such a degree as the Sandwich Islanders; their food is, however, of a very light kind, and easy digestion.

On the 22nd of January, the air being pleasant, and the sun occasionally visible, I had all my packages assorted by nine A.M., and engaged my old guide, Honori, and nine men to accompany me to the volcano and to Mouna Roa. As usual, there was a formidable display of luggage, consisting of *Tapas, Calabashes, Poe, Taro*, &c., while each individual provided himself with the solace of a staff of sugar-cane, which

shortens with the distance, for the pedestrian, when tired and thirsty, sits down and bites off an inch or two from the end of his staff. A friend accompanied me as far as his house on the road, where there is a large church, his kind intention being to give me some provision for the excursion, but as he was a stout person, I soon outstripped him. On leaving the bay, we passed through a fertile spot, consisting of Taro patches in ponds, where the ground is purposely overflowed, and afterwards covered with a deep layer of Fern-leaves to keep it damp. Here were fine groves of *Bread-fruit* and ponds of Mullet and Ava-fish; the scenery is beautiful, being studded with dwellings and little plantations of vegetables and of *Morus papyrifera*, of which there are two kinds, one much whiter than the other. The most striking feature in the vegetation consists in the Tree-Fern, some smaller species of the same tribe, and a curious kind of *Compositæ*, like an *Eupatorium*. At about four miles and a half from the bay, we entered the wood, through which there is a tolerably cleared path, the muddy spots being rendered passable by the stems or trunks of Tree-Ferns, laid close together crosswise. They seemed to be the same species as I had observed on the ascent to Mouna Kuāh. About an hour's walk brought us through the wood, and we then crossed another open plain of three miles and a half, at the upper end of which, in a most beautiful situation, stands the church, and close to it the chief's house. Some heavy showers had drenched us through; still, as soon as our friend arrived, and the needful arrangements were made, I started and continued the ascent over a very gently rising ground, in a southerly direction, passing through some delightful country, interspersed with low timber. At night we halted at a house, of which the owner was a very civil person, though remarkably talkative. Four old women were inmates of the same dwelling, one of whom, eighty years of age, with hair white as snow, was engaged in feeding two favourite cats with fish. My little terrier disputed the fare with them, to the no small annoyance of their mistress. A well-looking young female amused me with singing, while she was engaged in the process of cooking a dog on heated stones. I also observed a handsome young man, whose very strong stiff black hair was allowed to grow to a great length on the top of his head, while it was cut close over the ears, and falling down on the back of his head and neck, had all the appearance of a Roman helmet.

January the 23rd. This morning the old lady was engaged in feeding a dog with fox-like ears, instead of her cats. She compelled the poor animal to swallow *Poe*, by cramming it into his mouth, and what he put out at the sides, she took up and ate herself; this she did, as she informed me, by way of fattening the dog for food. A little while before day-break my host went to the door of the lodge, and after calling over some extraordinary words which would seem to set orthography at defiance, a loud grunt in response from under the thick shade of some adjoining Tree-Ferns, was followed by the appearance of a fine large black pig, which coming at his master's call, was forthwith caught and killed for the use of myself and my attendants. The meat was cooked on heated stones, and three men were kindly sent to carry it to the volcano, a distance of twenty-three miles, tied up in the large leaves of Banana and Ti-tree. The morning was deliciously cool and clear, with a light breeze. Immediately on passing through a narrow belt of wood, where the timber was large, and its trunks matted with parasitic Ferns, I arrived at a tract of ground, over which there was but a scanty covering of soil above the lava, interspersed with low bushes and Ferns. Here I beheld one of the grandest scenes imaginable; —Mouna Roa reared his bold front, covered with snow, far above the region of verdure, while Mouna Kuāh was similarly clothed, to the timber region on the South side, while the summit was cleared of the snow that had fallen on the nights of the 12th and two following days. The district of Hido, "Byron's Bay," which I had

quitted the previous day, presented, from its great moisture, a truly lovely appearance, contrasting in a striking manner with the country where I then stood, and which extended to the sea, whose surface bore evident signs of having been repeatedly ravaged by volcanic fires. In the distance, to the South-West, the dense black cloud which overhangs the great volcano, attests, amid the otherwise unsullied purity of the sky, the mighty operations at present going on in that immense laboratory. The lava, throughout the whole district, appeared to be of every colour and shape, compact, bluish and black, porous or vesicular, heavy and light. In some places it lies in regular lines and masses, resembling narrow horizontal basaltic columns; in others, in tortuous forms, or gathered into rugged humps of small elevation; while, scattered over the whole plain, are numerous extinct, abrupt, generally circular craters, varying in height from one hundred to three hundred feet, and with about an equal diameter at their tops. At the distance of five miles from the volcano, the country is more rugged, the fissures in the ground being both larger and more numerous, and the whole tract covered with gravel and lava, &c., ejected at various periods from the crater. The steam that now arose from the cracks bespoke our near approach to the summit, and at two P. M., I arrived at its northern extremity, where finding it nearly level, and observing that water was not far distant, I chose that spot for my encampment. As, however, the people were not likely to arrive before the evening, I took a walk round the West side, now the most active part of the volcano, and sat down there, not correctly speaking, to enjoy, but to gaze with wonder and amazement on this terrific sight, which inspired the beholder with a fearful pleasure.

From the descriptions of former visitors, I judge that Mouna Roa must now be in a state of comparative tranquillity. A lake of liquid fire, in extent about a thirteenth part of the whole crater, was boiling with furious agitation; not constantly, however, for at one time it appeared calm and level, the numerous fiery red streaks on its surface alone attesting its state of ebullition, when again, the red hot lava would dart upwards and boil with terrific grandeur, spouting to a height which, from the distance at which I stood, I calculated to be from forty to seventy feet, when it would dash violently against the black ledge, and then subside again for a few moments. Close by the fire was a chimney, above forty feet high, which occasionally discharges its steam, as if all the steam-engines in the world were concentrated in it. This preceded the tranquil state of the lake, which is situated near the South-West, or smaller end of the crater. In the centre of the Great Crater, a second lake of fire, of circular form, but smaller dimensions, was boiling with equal intensity: the noise was dreadful beyond all description. The people having arrived, Honori last, my tent was pitched twenty yards back from the perpendicular wall of the crater; and as there was an old hut of Ti-leaves on the intermediate bank, only six feet from the extreme verge, my people soon repaired it for their own use. As the sun sunk behind the western flank of Mouna Roa, the splendour of the scene increased; but when the nearly full moon rose in a cloudless sky, and shed her silvery brightness on the fiery lake, roaring and boiling in fearful majesty, the spectacle became so commanding, that I lost a fine night for making astronomical observations, by gazing on the volcano, the illumination of which was but little diminished by a thick haze that set in at midnight.

On Friday, January the 24th, the air was delightfully clear, and I was enabled to take the bearings of the volcano and adjoining objects with great exactness. To the North of the crater are numerous cracks and fissures in the ground, varying in size, form, and depth, some long, some straight, round, or twisted, from whence steam constantly issued, which in two of them is rapidly condensed, and collects in small basins or wells, one of which is situated at the immediate edge of the crater, and the other four hundred and eighty

yards to the North of it. The latter, fifteen inches deep, and three feet in diameter, about thirteen feet North of a very large fissure, according to my thermometer, compared with that at Greenwich and at the Royal Society, and found without error, maintains a temperature of 65°. The same instrument, suspended freely in the above-mentioned fissure, ten feet from the surface, expressed, by repeated trials, 158°; and an equal temperature was maintained when it was nearly level with the surface. When the Islanders visit this mountain, they invariably carry on their cooking operations at this place. Some pork and a fowl that I had brought, together with Taro-roots and Sweet Potatoes were steamed here to a nicety in twenty-seven minutes, having been tied up in leaves of Banana. On the sulphur bank are many fissures, which continually exhale sulphureous vapours, and form beautiful prisms, those deposited in the inside being the most delicate and varied in figure, encrusting the hollows in masses, both large and small, resembling swallows' nests on the wall of a building. When severed from the rock or ground, they emit a crackling noise by the contraction of the parts in the process of cooling. The great thermometer, placed in the holes, showed the temperature to be 195° 5′, after repeated trials which all agreed together, the air being then 71°.

I had furnished shoes for those persons who should descend into the crater with me, but none of them could walk when so equipped, preferring a mat sole, made of tough leaves, and fastened round the heel and between the toes, which seemed indeed to answer the purpose entirely well. Accompanied by three individuals, I proceeded at one P. M. along the North side, and descended the first ledge over such rugged ground as bespoke a long state of repose, the fissures and flanks being clothed with verdure of considerable size: thence we ascended two hundred feet to the level platform that divides the great and small volcanoes. On the left, a perpendicular rock, three hundred feet above the level, shows the extent of the volcano to have been originally much greater than it is at present. The small crater appears to have enjoyed a long period of tranquillity, for down to the very edge of the crust of the lava, particularly on the East side, there are trees of considerable size, on which I counted from sixty to one hundred and twenty-four annual rings or concentric layers. The lava at the bottom flowed from a spot, nearly equidistant from the great and small craters, both uniting into a river, from forty to seventy yards in breadth, and which appears comparatively recent. A little South of this stream, over a dreadfully rugged bank, I descended the first ledge of the crater, and proceeded for three hundred yards over a level space, composed of ashes, scoriæ, and large stones that have been ejected from the mouth of the volcano. The stream formerly described is the only fluid lava here. Hence, to arrive at the black ledge, is another descent of about two hundred and forty feet, more difficult to be passed than any other, and this brings the traveller to the brink of the black ledge, where a scene of all that is terrific to behold presents itself before his eyes. He sees a vast basin, recently in a state of igneous fusion, now, in cooling, broken up, somewhat in the manner of the great American lakes when the ice gives way, in some places level in large sheets, elsewhere rolled in tremendous masses, and twisted into a thousand different shapes, sometimes even being filamentose, like fine hair, but all displaying the mighty agency still existing in this immense depository of subterraneous fire. A most uncomfortable feeling is experienced when the traveller becomes aware that the lava is hollow and faithless beneath his tread. Of all sensations in nature, that produced by earthquakes or volcanic agency is the most alarming: the strongest nerves are unstrung, and the most courageous mind feels weakened and unhinged, when exposed to either. How insignificant are the operations of man's hands, taken in their vastest extent, when compared with the magnitude of the works of God!

On the black ledge, the thermometer,

held in the hand, five feet from the ground, indicated a temperature of 89°, and when laid on the lava, if in the sun's rays, 115°; and 112° in the shade; on the brink of the burning lake, at the South end, it rose to 124°. Over some fissures in the lava, where the smoke was of a greyish rather than a blue tinge, the thermometer stood at 94°. I remained for upwards of two hours in the crater, suffering all the time an intense headache, with my pulse strong and irregular, and my tongue parched, together with other symptoms of fever. The intense heat and sulphurous nature of the ground had corroded my shoes so much, that they barely protected my feet from the hot lava. I ascended out of the crater at the South-west, or small end, over two steep banks of scoriæ and two ledges of rock, and returned by the West side to my tent, having thus walked quite round this mighty crater. The evening was foggy; I took some cooling medicine, and lay down early to rest.

Saturday, January the 25th.—I slept profoundly till two A.M., when, as not a speck could be seen in the horizon, and the moon was unusually bright, I rose with the intention of making some lunar observations, but though the thermometer stood at 41°, still the keen mountain-breeze affected me so much, of course mainly owing to the fatigue and heat I had suffered the day before, that I was reluctantly obliged to relinquish the attempt, and being unable to settle again to sleep, I replenished my blazing stock of fuel, and sat gazing on the roaring and agitated state of the crater, where three new fires had burst out since ten o'clock the preceding evening. Poor Honori, my guide, who is a martyr to asthma, was so much affected by their exhalations (for they were on the North bank, just below my tent), that he coughed incessantly the whole night, and complained of cold, though he was wrapped in my best blanket, besides his own tapas and some other articles which he had borrowed from my Woahu man. The latter slept with his head towards the fire, coiled up most luxuriously, and neither cold, heat, nor the roaring of the volcano at all disturbed his repose.

Leaving the charge of my papers and collections under the special care of one individual, and giving plenty of provision for twelve days to the rest, consisting of one quarter of pork, with *poe* and *taro*, I started for Kapupala soon after eight A.M. The path struck off for two miles in a North-West direction, to avoid the rugged lava and ashes on the West flank of Mouna Roa, still it was indescribably difficult in many places, as the lava rose in great masses, some perpendicular, others lying horizontal, in fact with every variation of form and situation. In other parts the walking was pretty good, over grassy undulating plains, clothed with a healthy sward, and studded here and there with *Maurarii* Trees in full blossom, a beautiful tree, much resembling the English Laburnum. As I withdrew from the volcano in order to obtain a good general view of the country lying South and betwixt me and the sea, I ascertained the western ridge or verge of the volcano to be decidedly the most elevated of the table land: and a narrow valley lies to the West of it. A low ridge runs from the mountain, southward, to the sea, terminating at the South end, in a number of craters, of various form and extent. West of this low ridge between the gentle ascent of grassy ground on Mouna Roa there is a space of five to seven miles in breadth to the Grand Discharge from the Great Volcano, where it falls into the ocean at Kapupala. The present aspect of the crater leads me to think that there has been no *overflowing* of the lava for years: the discharge is evidently from the subterranean vaults below. In 1822, the Islanders say there was a great discharge in this direction. Among the grassy undulating ground are numerous caves, some of great magnitude, from forty to sixty-five feet high, and from thirty to forty feet broad, many of them of great length, like gigantic arches, and very rugged. These generally run at right angles with the dome of Mouna Roa and the sea. Some of these natural tunnels may be

traced for several miles in length, with occasional holes of different sizes in the roofs, screened sometimes with an overgrowth of large Trees and Ferns, which renders walking highly dangerous. At other places, the tops of the vaults have fallen in for the space of one hundred or even three hundred yards, an occurrence which is attributable to the violent earthquakes that sometimes visit this district, and which, as may be readily imagined from the number of these tunnels, is not well supplied with water. The inhabitants convert these caverns to use in various ways; employing them occasionally as permanent dwellings, but more frequently as cool retreats where they carry on the process of making native cloth from the bark of the *Mulberry Tree*, or where they fabricate and shelter their canoes from the violent rays of the sun. They are also used for goat-folds and pig-styes, and the fallen-in places, where there is a greater depth of decomposed vegetable matter, are frequently planted with *Tobacco, Indian Corn, Melons*, and other choice plants. At a distance of ten miles North of Kapupala, and near the edge of the path, are some fine caverns, above sixty feet deep. The water, dropping from the top of the vault, collected into small pools below, indicated a temperature of 50°, the air of the cave itself 51°, while in the shade on the outside the thermometer stood at 82°. The interiors of the moist caverns are of a most beautiful appearance; not only from the singularity of their structure, but because they are delightfully fringed with *Ferns, Mosses*, and *Jungermanniæ*, thus holding out to the Botanist a most inviting retreat from the overpowering rays of a tropical sun.

Arrived at Kapupala, at three P. M., I found that the chief or head man had prepared a house for me, a nice and clean dwelling, with abundance of fine mats, &c., but as near it there stood several large canoes filled with water, containing Mulberry Bark in a state of fermentation, and highly offensive, as also a large pig-fold, surrounded by a lava-wall, and shaded with large bushes of *Ricinus communis*, altogether forming an unsuitable station for making observations, to say nothing of the din and bustle constantly going on when strangers are present, besides the annoyance from fleas, I caused my tent to be pitched one hundred yards behind the house. The chief would have been better pleased if I had occupied his dwelling, but through Honori, I had this matter explained to his satisfaction. He sent me a fowl, cooked on heated stones underground, some baked Taro, and Sweet Potatoes, together with a calabash full of delicious goat's-milk, poured through the husk of a Cocoa-nut in lieu of a sieve.

As strangers rarely visit this part of the island, a crowd soon assembled for the evening. The vegetation in this district can hardly be compared with that of Hido, nor are the natives so industrious: they have no fish-ponds, and cultivate little else than Taro, which they call *Dry Taro*, no Bananas, and but little Sugar-cane or other vegetables. Flocks of goats brouse over the hills, while fowls, turkeys, and pigs are numerous, and occupy the same dwellings with their owners.

Honori, my guide, interpreter, purveyor, and, I may say, friend (for in every department of his omnifarious capacity he is a good sort of fellow), preached to-day, Sunday the 26th, in his own language, to an assembly of both sexes, old and young, nearly two hundred in number, both morning and evening. I did not see him, but from my tent-door I could hear him in the School-house, a low small edifice, expounding and exhorting with much warmth. Having made so bold afterwards as to ask him where he took his text, he readily replied, that he "chose no text, but had taken occasion to say to the people a few good words concerning Paul when at Rome." He was evidently well pleased himself with his sermon, and seemed to please his audience also. I visited the school in the interval, when Honori had retired to compose his second sermon, and found the assemblage under the direction of the chief, who appears to be a good man, though far from an apt scholar; they

were reading the second chapter of the Epistle to the Galatians, and proceeded to the third, reading verse and verse, all round. The females were by far the most attentive, and proved themselves the readiest learners. It is most gratifying to see, far beyond the pale of what is called civilization, this proper sanctification of the Lord's Day, not only consisting in a cessation from the ordinary duties, but in reading and reflecting upon the purifying and consolatory doctrines of Christianity. The women were all neatly dressed in the native fashion, except the chief's wife, and some few others who wore very clean garments of calico. The hair was either arranged in curls or braided on the temples, and adorned with tortoise-shell combs of their own making, and chaplets of balsamic flowers, the pea-flowering racemes of the Maurarii-Tree, and feathers, &c. The men were all in the national attire, and looked tolerably well dressed, except a few of the old gentlemen.

The schoolmaster, a little hump-backed man, about thirty years old, little more than three feet high, with disproportionately long legs, and having a most peculiar cast in his right eye, failed not to prompt and reprove his scholars when necessary, in a remarkably powerful tone of voice, which when he read, produced a trumpet-like sound, resembling the voice of a person bawling into a cask.

Honori "had the people called together" by the sound of a conch-shell, blown by a little imp of a lad, perched on a block of lava, in front of the school-house, when as in the morning, he "lectured" on the third chapter of St. John. The congregation was thinner than in the morning, many who lived at a distance having retired to their homes.

I spent the Monday (January the 27th) in making observations and arranging matters for returning to Mouna Roa: my men cooked a stock of Taro, and I purchased a fine large goat for their use.

Tuesday, January the 28th. I hired two guides, the elder of whom, a short stout man, was particularly recommended to me by the chief for his knowledge of the mountain. By profession he is a bird-catcher, going in quest of that particular kind of bird which furnishes the feathers of which the ancient cloaks, used by the natives of these islands, are made. The other guide was a young man. Three volunteers offered to accompany me; one a very stout, fat dame, apparently about thirty, another not much more than half that age, a really well-looking girl, tall and athletic: but to the first, the bird-catcher gave such an awful account of the perils to be undergone, that both the females finally declined the attempt, and only the third person, a young man, went with me. My original party of ten, besides Honori and the two guides, set out at eight, with, as usual, a terrible array of Taro, calabashes full of Poe, Sweet Potatoes, dry Poe tied up in Ti-leaves, and goat's flesh, each bearing a pole on his shoulder with a bundle at either end. Of their vegetable food, a Sandwich Islander cannot carry more than a week's consumption, besides what he may pick up on the way. One, whose office it was to convey five quires of paper for me, was so strangely attired, in a double-milled grey great coat, with a spencer of still thicker materials above it, that he lamented to his companions that his load was too great, and begged their help to lift it on his back. I had to show the fellow, who was blind of one eye, the unreasonableness of his grumbling by hanging the parcel, by the cord, on my little finger. He said, "Ah! the stranger is strong," and walked off. Among my attendants was one singular-looking personage, a stripling, who carried a small packet of instruments, and trotted away, arrayed in "a Cutty-Sark," of most "scanty longitude," the upper portion of which had been once of white, and the lower of red flannel. Honori brought up the rear, with a small telescope slung over his shoulder, and an umbrella, which, owing perhaps to his asthmatic complaint, he never fails to carry with him, both in fair and foul weather. We returned for about a mile and a half along the road that led to the Great Vol-

cano, and then struck off to the left in a small path that wound in a northerly direction up the green grassy flank of Mouna Roa. I soon found that Honori's cough would not allow him to keep up with the rest of the party, so leaving one guide with him, and making the bird-catcher take the lead, I proceeded at a quicker rate. This part of the island is very beautiful; the ground, though hilly, is covered with a tolerably thick coating of soil, which supports a fine sward of Grass, Ferns, climbing plants, and in some places, timber of considerable size, Coa, Tutui, and Mamme trees. Though fallen trees and brush-wood occasionally intercepted the path, still it was by no means so difficult as that by which I had ascended Mouna Kuāh. To avoid a woody point of steep ascent, we turned a little eastward, after having travelled about five miles and a half, and passed several deserted dwellings, apparently only intended as the temporary abodes of bird-catchers and sandal-wood-cutters. Calabashes and Pumpkins, with Tobacco, were the only plants that I observed growing near them. At eleven A. M. we came to a small pool of fresh water, collected in the lava, the temperature of which was 55°, here my people halted for a few minutes to smoke. The barometer stood at 26 inch., the air 62°, and the dew-point at 58°. The wind was from the South, with a gentle fanning breeze and a clear sky. Hence the path turns North-West, for a mile and half, becoming a little steeper, till it leads to a beautiful circular well, three feet deep, flowing in the lava, its banks fringed with Strawberry Vines, and shaded by an Acacia Tree grove. Here we again rested for half an hour. We might be said here to have ascended above the woody country; the ground became more steep and broken, with a thinner soil and trees of humbler growth, leading towards the South-East ridge of Mouna Roa, which, judging from a distance, appeared the part to which there is the easiest access. I would recommend to any Naturalists who may in future visit this mountain, to have their canteens filled at the well just mentioned, for my guide, trusting to one which existed in a cave further up, and which he was unable to find, declined to provide himself with this indispensable article at the lower well, and we were consequently put to the greatest inconvenience. Among the brush-wood was a strong kind of Raspberry-bush, destitute of leaves; the fruit, I am told, is white. At four P. M. we arrived at a place where the lava suddenly became very rugged, and the brush-wood low, where we rested and chewed sugar-cane, of which we carried a large supply, and where the guides were anxious to remain all night. As this was not very desirable, since we had no water, I proceeded for an hour longer, to what might be called the Line of Shrubs, and at two miles and a half further on, encamped for the night. We collected some small stems of a heath-like plant, which, with the dried stalks of the same species of *Compositæ* which I observed on Mouna Kuāh, afforded a tolerably good fire. The man who carried the provisions did not make his appearance—indeed it is very difficult, except by literally driving them before you, to make the natives keep up with an active traveller. Thus I had to sup upon Taro-roots. Honori, as I expected, did not come up. I had no view of the surrounding country, for the region below, especially over the land, was covered with a thick layer of fleecy mist, and the cloud which always hovers above the great volcano, over-hung the horizon and rose into the air, like a great tower. Sun-set gave a totally different aspect to the whole, the fleecy clouds changed their hue to a vapoury tint, and the volume of mist above the volcano, which is silvery bright during the prevalence of sunshine, assumed a fiery aspect, and illumined the sky for many miles around. A strong North-West mountain-breeze sprung up, and the stars, especially Canopus and Sirius, shone with unusual brilliancy. Never, even under a tropical sky, did I behold so many stars. Sheltered by a little brush-wood, I lay down on the lava beside the fire, and enjoyed a good night's rest, while my attend-

ants swarmed together in a small cave, which they literally converted into an oven by the immense fire they kindled in it.

Wednesday, January the 29th.—The morning rose bright and clear, but cold, from the influence of a keen mountain-breeze. As the man who carried the provisions was still missing, the preparation of breakfast occupied but little time, so that, accompanied by the bird-catcher and Cutty-Sark, I started at half-past six for the summit of the mountain, leaving the others to collect fuel and to look for water. Shortly before day-break the sky was exceedingly clear and beautiful, especially that part of the horizon where the sun rose, and above which the upper limb of his disc was visible like a thread of gold, soon to be quenched in a thick haze, which was extended over the horizon. It were difficult, nay, almost impossible, to describe the beauty of the sky and the glorious scenes of this day. The lava is terrible beyond description, and our track lay over ledges of the roughest kind, in some places glassy and smooth like slag from the furnace, compact and heavy like basalt; in others, tumbled into enormous mounds, or sunk in deep valleys, or rent into fissures, ridges, and clefts. This was at the verge of the snow —not twenty yards of the whole space could be called level or even. In every direction vast holes or mouths are seen, varying in size, form, and colour, from ten to seventy feet high. The lava that has been vomited forth from these openings presents a truly novel spectacle. From some, and occasionally indeed from the same mouth, the streams may be seen, pressed forward transversely, or in curved segments, while other channels present a floating appearance; occasionally the circular tortuous masses resemble gigantic cables, or are drawn into cords, or even capillary threads, finer than any silken thread, and carried to a great distance by the wind. The activity of these funnels may be inferred from the quantity of slag lying round them, its size, and the distance to which it has been thrown. Walking was rendered dangerous by the multitude of fissures, many of which are but slightly covered with a thin crust, and every where our progress was exceedingly laborious and fatiguing. As we continued to ascend, the cold and fatigue disheartened the Islanders, who required all the encouragement I could give to induce them to proceed. As I took the lead, it was needful for me to look behind me continually, for when once out of sight, they would pop themselves down, and neither rise nor answer to my call. After resting for a few moments at the last station, I proceeded about seven miles further, over a similar kind of formation, till I came to a sort of low ridge, the top of which I gained soon after eleven P. M., the thermometer indicating 37°, and the sky very clear. This part was of gradual ascent, and its summit might be considered the southern part of the dome. The snow became very deep, and the influence of the sun melting its crust, which concealed the sharp points of the lava, was very unfavourable to my progress. From this place to the North towards the centre of the dome, the hill is more flattened. Rested a short time, and a few moments before noon, halted near the highest black shaggy chimney to observe the sun's passage. In recording the following observations, I particularly note the places, in order that future visitors may be able to verify them. To the S. W. of this chimney, at the distance of one hundred and seventy yards, stands a knoll of lava, about seventy feet above the gradual rise of the place. The altitude was 104° 52′ 45″. This observation was made under highly favourable circumstances, on a horizon of mercury, without a roof, it being protected from the wind by a small oil-cloth :—bar. 18° 953′; therm. 41°; in the sun's rays 43° 5′; and when buried in the snow, 31°; the dew-point at 7°!! wind S. W. The summit of this extraordinary mountain is so flat, that from this point no part of the island can be seen, not even the high peaks of Mouna Kuāh, nor the distant horizon of the sea, though the sky was remarkably clear. It is a horizon of itself, and about seven miles in diameter. I ought, ere now, to have said

that the bird-catcher's knowledge of the volcano did not rise above the woody region, and now he and my two other followers were unable to proceed further. Leaving these three behind, and accompanied by only Calipio, I went on about two miles and a half, when the Great Terminal Volcano or Cone of Mouna Roa burst on my view: all my attempts to scale the black ledge here were ineffectual, as the fissures in the lava were so much concealed, though not protected by the snow, that the undertaking was accompanied with great danger. Most reluctantly was I obliged to return, without being able to measure accurately its extraordinary depth. From this point I walked along upon the brink of the high ledge, along the East side, to the hump, so to speak, of the mountain, the point which, as seen from Mouna Kuāh, appears the highest. As I stood on the brink of the ledge, the wind whirled up from the cavity with such furious violence that I could hardly keep my footing within twenty paces of it. The circumference of the black ledge of the nearly circular crater, described as nearly as my circumstances would allow me to ascertain, is six miles and a quarter. The ancient crater has an extent of about twenty-four miles. The depth of the ledge, from the highest part (perpendicular station on the East side) by an accurate measurement with a line and plummet, is twelve hundred and seventy feet. It appears to have filled up considerably all round; that part to the North of the circle seeming to have, at no very remote period, undergone the most violent activity, not by boiling and overflowing, nor by discharging under ground, but by throwing out stones of immense size to the distance of miles around its opening, together with ashes and sand. Terrible chasms exist at the bottom, appearing, in some places, as if the mountain had been rent to its very roots: no termination can be seen to their depth, even when the eye is aided with a good glass, and the sky is clear of smoke, and the sun shining brightly. Fearful indeed must the spectacle have been, when this volcano was in a state of activity. The part to the South of the circle, where the outlet of the lava has evidently been, must have enjoyed a long period of repose. Were it not for the dykes on the West end, which show the extent of the ancient cauldron, and the direction of the lava, together with its proximity to the existing volcano, there is little to arrest the eye of the Naturalist over the greater portion of this huge dome, which is a gigantic mass of slag, scoriæ, and ashes. The barometer remained stationary during the whole period spent on the summit, nor was there any change in the temperature nor in the dew-point today. While passing, from eight to nine o'clock, over the ledges of lava of a more compact texture, with small but numerous vesicles, the temperature of the air being 36°, 37°, and the sun shining powerfully, a sweet musical sound was heard, proceeding from the cracks and small fissures, like the faint sound of musical glasses, but having at the same time, a kind of hissing sound, like a swarm of bees. This may perhaps be owing to some great internal fire escaping—or is it rather attributable to the heated air on the surface of the rocks, rarefied by the sun's rays? In a lower region, this sound might be overlooked, and considered to proceed, by possibility, from the sweet harmony of insects, but in this high altitude it is too powerful and remarkable not to attract attention. Though this day was more tranquil than the 12th, when I ascended Mouna Kuāh, I could perceive a great difference in sound; I could not now hear half so far as I did on that day when the wind was blowing strong. This might be owing to this mountain being covered with snow, whereas, on the 12th, Mouna Kuāh was clear of it. Near the top I saw one small bird, about the size of a common sparrow, of a light mixed grey colour, with a faintly yellow beak—no other living creature met my view above the woody region. This little creature, which was perched on a block of lava, was so tame as to permit me to catch it with my hand, when I instantly restored it its liberty. I also saw a dead hawk in one of the caves. On the East side of the black ledge of the Great

Terminal Crater, is a small conical funnel of scoriæ, the only vent-hole of that substance that I observed in the crater. This mountain appears to be differently formed from Mouna Kuāh; it seems to be an endless number of layers of lava, from different overflowings of the great crater. In the deep caves at Kapupala, two thousand feet above the level of the sea, the several strata are well defined, and may be accurately traced, varying in thickness with the intensity of the action, and of the discharge that has taken place. Between many of these strata are layers of earth, containing vegetable substances, some from two feet to two feet seven inches in thickness, which bespeak a long state of repose between the periods of activity in the volcano. It is worthy of notice that the thickest strata are generally the lowest, and they become thinner towards the surface. In some places I counted twenty-seven of these layers, horizontal, and preserving the declination of the mountain. In the caves which I explored near my camp, which are from forty to seventy feet deep, thin strata of earth intervene between the successive beds of lava, but none is found nearer the surface than thirteen layers. No trace of animal, shell, or fish, could I detect in any of the craters or caves, either in this mountain or Mouna Kuāh. At four P. M. I returned to the centre of the dome, where I found the three men whom I had left all huddling together to keep themselves warm. After collecting a few specimens of lava, no time was to be lost in quitting this dreary and terrific scene. The descent was even more fatiguing, dangerous, and distressing than the ascent had proved, and required great caution in us to escape unhurt; for the natives, benumbed with cold, could not walk fast. Darkness came on all too quickly, and though the twilight is of considerable duration, I was obliged to halt, as I feared, for the night, in a small cave. Here, though sheltered from the N. W. breeze, which set in more and more strongly as the sun sunk below the horizon; the thermometer fell to 19°, and as I was yet far above the line of vegetation, unable to obtain any materials for a fire, and destitute of clothing, except the thin garments soaked in perspiration in which I had travelled all day, and which rendered the cold most intense to my feelings, I ventured, between ten and eleven P. M. to make an effort to proceed to the camp. Never shall I forget the joy I felt when the welcome moon, for whose appearance I had long been watching, first showed herself above the volcano. The singular form which this luminary presented, was most striking. The darkened limb was uppermost, and as I was sitting in darkness, eagerly looking for her appearance on the horizon, I descried a narrow silvery belt, 4° to 5° high, emerging from the lurid fiery cloud of the volcano. This I conceived to be a portion of the light from the fire, but a few moments showed me the lovely moon shining in splendour in a cloudless sky, and casting a guiding beam over my rugged path. Her pale face actually threw a glow of warmth into my whole frame, and I joyfully and thankfully rose to scramble over the rough way, in the solitude of the night, rather than await the approach of day in this comfortless place. Not so thought my followers. The bird-catcher and his two companions would not stir; so with my trusty man Calipio, who follows me like a shadow, I proceeded in the descent. Of necessity we walked slowly, stepping cautiously from ledge to ledge, but still having exercise enough to excite a genial heat. The splendid constellation of Orion, which had so often attracted my admiring gaze in my own native land, and which had shortly passed the meridian, was my guide. I continued in a South-East direction till two o'clock, when all at once I came to a low place, full of stunted shrubs, of more robust habit, however, than those at the camp. I instantly struck a light, and found by the examination of my barometer, that I was nearly five hundred feet below the camp. No response was given to our repeated calls—it was evident that no human being was near, so by the help of the moon's light, we shortly collected plenty of fuel, and kindled a fine fire. No sooner did its

warmth and light begin to diffuse themselves over my frame, than I found myself instantly seized with violent pain and inflammation in my eyes, which had been rather painful on the mountain, from the effect of the sun's rays shining on the snow; a slight discharge of blood from both eyes followed, which gave me some relief, and which proved that the attack was as much attributable to violent fatigue as any other cause. Having tasted neither food nor water since an early hour in the morning, I suffered severely with thirst; still I slept for a few hours, dreaming the while of gurgling cascades, overhung with sparkling rainbows, of which the dewy spray moistened my whole body, while my lips were all the time glued together with thirst, and my parched tongue almost rattled in my mouth. My poor man, Calipio, was also attacked with inflammation in his eyes, and gladly did we hail the approach of day. The sun rose brightly on the morning of Thursday, January 30th, and gilding the snow over which we had passed, showed our way to have been infinitely more rugged and precarious than it had appeared by moon-light. I discovered that by keeping about a mile and a half too much to the East, we had left the camp nearly five hundred feet above our present situation; and returning thither over the rocks, we found Honori engaged in preparing breakfast. He had himself reached the camp about noon on the second day. He gave me a Calabash full of water, with a large piece of ice in it, which refreshed me greatly. A few drops of opium in the eyes afforded instant relief both to Calipio and myself. The man with the provision was here also, so we shortly made a comfortable meal, and immediately after, leaving one man behind with some food for the bird-catcher and his two companions, we prepared to descend, and started at nine A. M. to retrace the path by which we had come. Gratified though one may be at witnessing the wonderful works of God in such a place as the summit of this mountain presents, still it is with thankfulness that we again approach a climate more congenial to our natures, and welcome the habitations of our fellow-men, where we are refreshed with the scent of vegetation, and soothed by the melody of birds. When about three miles below the camp, my three companions of yesterday appeared like mawkins, on the craggy lava, just at the very spot where I had come down. A signal was made them to proceed to the camp, which was seen and obeyed, and we proceeded onwards, collecting a good many plants by the way. Arriving at Strawberry Well, we made a short halt to dine, and ascertained the barometer to be 25° 750′; air 57°, and the well 51°; dew 56°. There were vapoury light clouds in the sky, and a S. W. wind. We arrived at Kapupala at four P. M. The three other men came up at seven, much fatigued, like myself. Bar. at Kapupala at eight P. M. 27° 936′; air 57°; and the sky clear."

This is the closing sentence of Mr. Douglas' Journal; penned indeed, by the date, some months previous to the *letter* which immediately precedes this portion of the Journal (May 6th, 1834), and which was certainly among the last, if it were not the very last, that he addressed to any friend in Europe, and that gave hopes of seeing him home at no distant period. Of the events which happened between that period and the melancholy accident which occasioned his death, a space of little more than two months, there is, unfortunately, no information. The first knowledge of his decease, which reached one of the members of the family in this country, was in a peculiarly abrupt and painful manner. It was seen in a number of the Liverpool Mercury, by his brother, Mr. John Douglas, when looking for the announcement of the marriage of a near relative. He immediately set out for Glasgow, to communicate the unwelcome tidings to me: and in a few days they were confirmed on more unquestionable authority, by a letter from Richard Charlton, Esq., H. B. M. Consul at the Sandwich Islands, to James Bandinel, Esq., inclosing a most affecting document, relative to the event, from two Missionaries,

the Rev. Joseph Goodrich and the Rev. John Diell, both of which I am anxious to record here in testimony of the deep interest felt by these gentlemen in the fate of our deceased friend: a feeling, indeed, which assuredly extended to all who knew him.

COPY OF A LETTER FROM THE MISSIONARIES OF HAWAII TO RICHARD CHARLTON, ESQ., HIS BRITANNIC MAJESTY'S CONSUL AT THE SANDWICH ISLANDS.

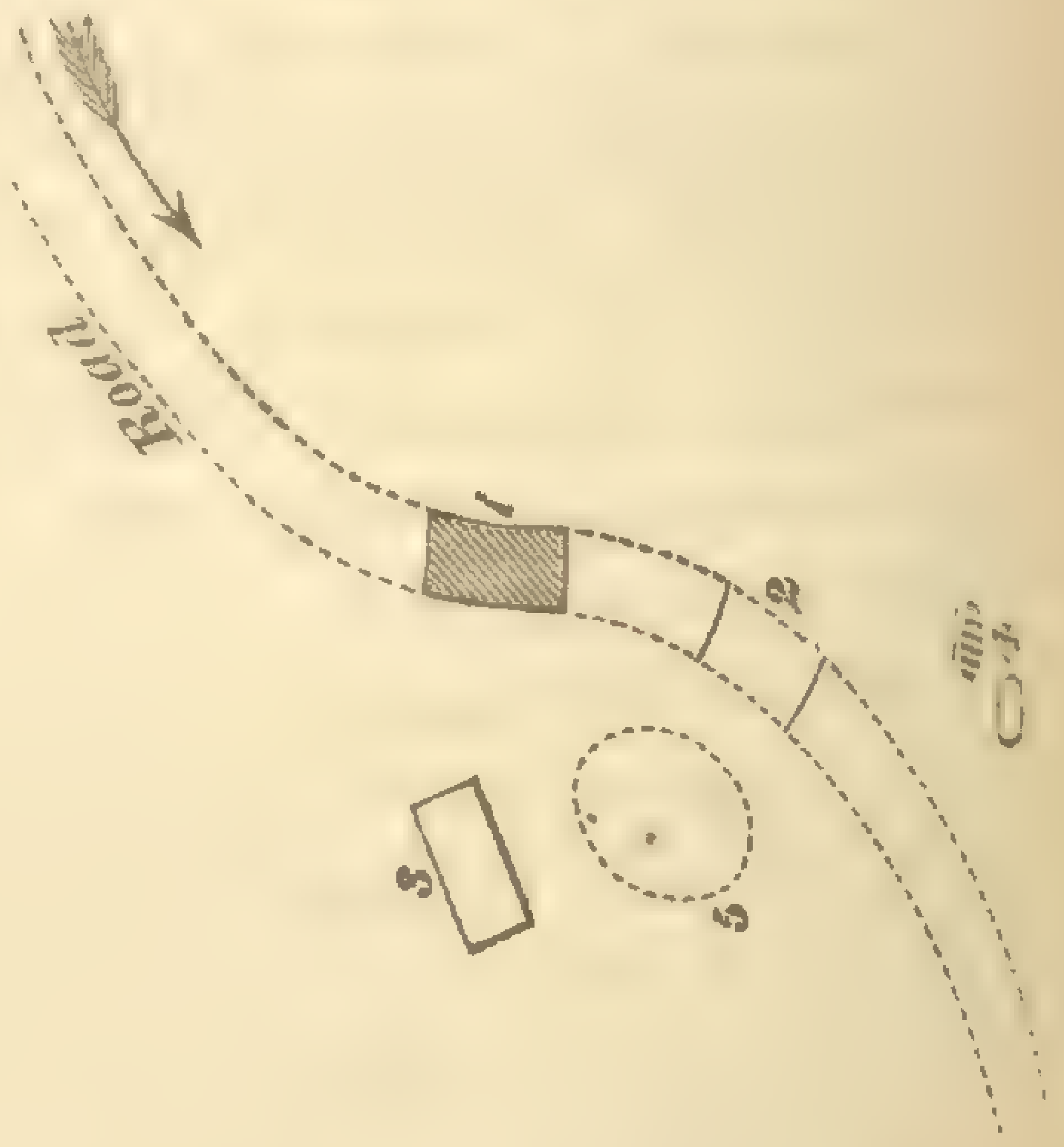
Hido, Hawaii, July 15th, 1834.

Dear Sir,—Our hearts almost fail us when we undertake to perform the melancholy duty which devolves upon us, to communicate the painful intelligence of the death of our friend Mr. Douglas, and such particulars as we have been able to gather respecting this distressing providence. The tidings reached us when we were every moment awaiting his arrival, and expecting to greet him with a cordial welcome: but alas! He whose thoughts and ways are not as our's, saw fit to order it otherwise; and instead of being permitted to hail the *living* friend, our hearts have been made to bleed while performing the offices of humanity to his mangled corpse. Truly we must say, that the "ways of the Lord are mysterious, and His judgments past finding out!" but it is our unspeakable consolation to know, that those ways are directed by infinite wisdom and mercy, and that though "clouds and darkness are round about Him, yet righteousness and judgment are the habitation of His throne!" But we proceed to lay before you as full information as it is in our power to do at the present time, concerning this distressing event. As Mr. Diell was standing in the door of Mr. Goodrich's house yesterday morning, about eight o'clock, a native came up, and with an expression of countenance which indicated but too faithfully that he was the bearer of sad tidings, inquired for Mr. Goodrich. On seeing him, he communicated the dreadful intelligence, that the body of Mr. Douglas had been found on the mountains, in a pit excavated for the purpose of taking wild cattle, and that he was supposed to have been killed by the bullock which was in the pit, when the animal fell in. Never were our feelings so shocked, nor could we credit the report, till it was painfully confirmed as we proceeded to the beach, whither his body had been conveyed in a canoe, by the native who informed us of his death. As we walked down with the native, and made further inquiries of him, he gave for substance the following relation:—that on the evening of the 13th instant, the natives who brought the body down from the mountain came to his house at Laupashoohoi, about twenty-five or thirty miles distant from Hido, and employed him to bring it to this place in his canoe—the particulars which he learned from them were as follows:—that Mr. D. left Rohala Point last week, in company with a foreigner (an Englishman), as a guide, and proceeded to cross Mouna Roa on the North side—that on the 12th he dismissed his guide, who cautioned him, on parting, to be very careful lest he should fall into the pits excavated for the purpose mentioned above; describing them as near the place where the cattle resorted to drink—that soon after Mr. D. had dismissed his guide, he went back a short distance to get some bundle which he had forgotten, and that as he was retracing his steps, at some fatal moment he tumbled into one of the pits in which a bullock had previously fallen—that he there was found dead by these same natives, who, ignorant of the time of his passing, were in pursuit of cattle, and observed a small hole in one end of the covering of the pit. At first they conjectured that a calf had fallen in; but on further examination they discerned traces of a man's footsteps, and then saw his feet, the rest of the body being covered with dust and rubbish. They went in pursuit of the guide, who returned, shot the beast in the hole, took out the corpse, and hired the natives at the price of four bullocks, which he killed immediately, to convey the body to the seashore. He himself accompanied them, and

procured the native, who related the affair to bring the corpse to this place, promising to come himself immediately, and that he would bring the compass-watch, which was somewhat broken, but still going; some money found in Mr. D.'s pocket; and the little dog, that faithful companion of our departed friend.—Thus far the report of the native, who brought the corpse in his canoe, and who professes to relate the facts to us, as he learned them from the natives who came down from the mountain. We do not stop, at present, to examine how far it is consistent or inconsistent with itself, as we have not the means of making full investigation into the matter. On reaching the canoe, our first care was to have the remains conveyed to some suitable place, where we could take proper care of them, and Mr. Dibble's family being absent, it was determined to carry the body to his house. But what an affecting spectacle was presented, as we removed the bullock's hide in which he had been conveyed!—we will not attempt to describe the agony of feeling which we experienced at that moment: can it be he? can it be he? we each exclaimed—can it be the man with whom we parted but a few days before, and who then was borne up with so high spirits and expectations, and whom but an hour previously, we were fondly anticipating to welcome to our little circle. The answer was but too faithfully contained in the familiar articles of dress—in the features, and in the noble person before us. They were those of our friend. The body, clothes, &c. appeared to be in the same state they were in when taken from the pit: the face was covered with dirt, the hair filled with blood and dust; the coat, pantaloons, and shirt, considerably torn. The hat was missing. On washing the corpse, we found it in a shocking state: there were ten to twelve gashes on the head—a long one over the left eye, another, rather deep, just above the left temple, and a deep one behind the right ear; the left cheek-bone appeared to be broken, and also the ribs on the left side. The abdomen was also much bruised, and also the lower parts of the legs. After laying him out, our first thought was to bury him within Mr. Goodrich's premises; but after we had selected a spot, and commenced clearing away the ground, doubts were suggested by a foreigner who was assisting us, and who has for some time been engaged in taking wild cattle, whether the wounds on the head could have been inflicted by a bullock. Mr. G. said that doubts had similarly arisen in his mind, while examining the body. The matter did not seem clear—many parts of the story were left in obscurity. How had Mr. Douglas been left alone — without any guide, foreign or native? — Where was John, Mr. Diell's coloured man, who left Honolulu with Mr. Diell, and who, on missing a passage with him from Lahaina, embarked with Douglas, as we are informed by the captain of the vessel in which Mr. D. sailed from Lahaina to Rohala Point, and then left the vessel with Mr. D. on the morning of the 9th instant, in order to accompany him across the mountain to Hido? How was it that Mr. D. should fall into a pit when retracing his steps, after having once passed it in safety? And if a bullock had already tumbled in, how was it that he did not see the hole necessarily made in its covering?—These difficulties occurred to our minds, and we deemed it due to the friends of Mr. D., and to the public, whom he had so zealously and so usefully served, that an examination should be made of the body by medical men. The only way by which this could be effected, was by preserving his body, and either sending it to Oahu or keeping it till it could be examined. The former method seemed most advisable; accordingly we had the contents of the abdomen removed, the cavity filled with salt, and placed in a coffin, which was then filled with salt, and the whole enclosed in a box of brine. Some fears are entertained whether the captain of the native vessel will convey the body: this can be determined in the morning. After the corpse was laid in the coffin, the members of the Mission family and several foreigners assembled at the house of Mr. Dibble, to pay their tribute of respect to the mortal remains of the deceased, and to improve this affecting

providence to their own good. Prayers were offered, and a brief address made; and we trust that the occasion may prove a lasting blessing to all who were present. After the services were concluded, the body was removed to a cool native house, where it was enclosed in the box.

16th. As neither the guide nor any natives have arrived, we have employed two foreigners to proceed to the place where the body was received on the sea-shore, with directions to find the persons who discovered it, and go with them to the pit, and after making as full inquiries as possible, to report to us immediately. So far as we can ascertain, the guide is an Englishman, a convict from Botany Bay, who left a vessel at these islands some years ago. He has a wife and one child with him, and to this circumstance in part may be attributed his delay. There are two native vessels in port, besides the one about to sail to-day. By these vessels we shall apprise you of all the information we can obtain, and yet hope that the darkness which involves the subject may be removed. Mr. G. has just returned from the vessel about to sail to-day. The application to convey the remains of Mr. D. to Honolulu will, we fear, prove unsuccessful, as the cargo is already taken in, consisting of wood, canoes, food, &c. It is barely possible that a consent may yet be obtained; but if not, you must be so kind as to dictate what course is to be pursued. Should you deem it advisable to come up in person, we think that the body will be in such a state of preservation, as will admit of its being examined upon your arrival. Meanwhile, we shall take all possible pains to procure information. The principal part of Mr. D.'s baggage, his trunks, instruments, &c. are in Mr. Goodrich's possession, who will take care of them, subject to your order.—*Three o'clock P. M.* Edward Gurney, the Englishman spoken of before, has arrived, and our minds are greatly relieved, as to the probable way in which the fatal event was brought about. He states, that on the 12th instant, about ten minutes before six in the morning, Mr. D. arrived at his house on the mountain, and wished him to point out the road, and go a short distance with him. Mr. D. was then alone, but said that his man had gone out the day before (this man was probably John, Mr. Diell's coloured man). After taking breakfast, Ned accompanied Mr. D. about three quarters of a mile, and after directing him in the path, and warning him of the traps, went on about half a mile further with him. Mr. D. then dismissed him, after expressing an anxious wish to reach Hido by evening, thinking he could find out the way himself. Just before Ned left him, he warned him particularly of three bullock-traps, about two miles and a half a-head, two of them lying directly in the road, the other on one side, as exhibited in the following rude sketch.



1. Trap empty, covered.
2. Ditto, cow in, open.
3. Ditto, bullock, open.
4. The place where Mr. Douglas' dog and bundle were found.
5. Water.

Ned then parted with Mr. D. and went back to skin some bullocks which he had previously killed. About eleven o'clock. two natives came in pursuit of him, and said that the European was dead; that they had found him in the pit where a bullock was. They mentioned, that as they were approaching this pit, one of them, observing some of the clothing on the side, exclaimed *Lole*, but in a moment afterwards discovered Mr. D. in the cave, trampled under the beast's feet. They immediately hastened back for Ned, who, leaving his work, ran into the house for a musket, ball, and hide; and on arriving at the pit, found the bullock standing upon poor Douglas'

body, which was lying on the right side. He shot the animal, and after drawing it to one side of the pit, succeeded in extricating the corpse. Douglas' cane was there, but not his dog and bundle: Ned knowing that he had the latter with him, asked for it. After a few moments' search, the dog was heard to bark, at a little distance a-head on the road to Hido. On coming up to the spot, indicated by No. 4, the dog and bundle were found. On further scrutiny, it appeared that Mr. D. had stopped for a moment and looked at the empty pit, No. 1,—and also at that where the cow was; and that after proceeding about fifteen fathoms up the hill, he had laid down his bundle and returned to the side of the pit where the bullock was entrapped, No. 3, and which was situated on the side of the pond opposite to that along which the road runs; and that whilst looking in, by making a false step, or some other fatal accident, he fell into the power of the infuriated animal, which speedily executed the work of death. The body was covered in part with stones, which probably prevented its being entirely crushed. After removing the corpse, Ned took charge of the dog and bundle, also of his watch and chronometer (which is injured in some way), his pocket compass, keys, and money, and after hiring the natives to convey the body to the shore, a distance of about twenty-seven miles, came directly to this place. This narrative clears up many of the difficulties which rested upon the whole affair, and perhaps affords a satisfactory account of the manner in which Mr. D. met with his awful death. We presume that it would be agreeable to you that the body should be sent down, and as the vessel is still delayed by a calm, we hope to receive a favourable answer from the captain. If we should not, it may perhaps be well to inter the body, which can easily be disinterred for examination, if desirable.

We have thus, dear Sir, endeavoured to furnish you with all the particulars we have been able to gather concerning this distressing event. It is no common death which has thus called forth our tears and sympathies: it presents a most affecting comment on the truth, that "in the midst of life we are in death!" How forcible then is the admonition to all of us, whose privilege it was to be acquainted with him who is thus snatched from us, to "prepare to meet our God," "for the Son of Man cometh at an hour that we know not of." You will be pleased, dear Sir, to accept for yourself and family, the expression of our kindest sympathies under this afflicting dispensation, and allow us to subscribe ourselves, with sincere regard, your friends and obedient servants,

(Signed) Joseph Goodrich,
John Diell.

P. S. The bearer, Mr. Martin, will take charge of the little dog. There are several matters of expenses, incurred for conveying the body to this place, paying the natives, &c., which Mr. Goodrich will meet, so far as can be done, with the clothes, &c. —of these and of Mr. D.'s other things, he will present a full statement.

A true copy.

Richard Charlton.

COPY OF A LETTER FROM MR. CHARLTON TO JAMES BANDINEL ESQ.

(Inclosing the above.)

Woahoo, August 6th, 1834.

My dear Sir,—It has devolved on me to inform you of the melancholy death of our friend, poor Douglas. On his arrival at this island from the Columbia River, he took the first opportunity of visiting Hawaii, where he remained for some time, with great satisfaction to himself, and usefulness to the public. After his return to this island, he suffered much from rheumatism; but on the 3rd ultimo, finding himself quite recovered, he re-embarked for Hawaii. On the 19th ult. I received the accompanying letter from Messrs. Diell and Goodrich, two gentlemen belonging to the Mission: from it you will learn the particulars relative to his melancholy fate. On the 3rd instant, the body was brought here in an American vessel. I immediately had it examined by the medical gentlemen, who gave it as their opinion that the several wounds were inflicted by the

bullock. I assure you that I scarcely ever received such a shock in my life. On opening the coffin, the features of our poor friend were easily traced, but mangled in a shocking manner, and in a most offensive state. The next day, I had his remains deposited in their last resting-place; the funeral was attended by Captain Seymour and several of the officers of His Majesty's Ship Challenger, and the whole of the foreign Residents. I have caused his grave to be built over with brick, and perhaps his friends may send a stone to be placed (with an inscription) upon it. As I am about to embark in the Challenger to-morrow for Otaheite, I have left all his effects in the hands of my friend, Mr. Rooke, with a request to sell his clothing, and forward his collections, books, papers, and instruments, to the Secretary of the Horticultural Society. One of his chronometers, reflecting circle, and dipping needle, are on board the Challenger, in charge of Capt. Seymour. As I do not know the address of the friends or relations of Mr. Douglas, I shall feel very much obliged to you to forward the copy of Messrs. Goodrich's and Diell's letter to them.

I remain, my dear Sir,

Yours, &c.

(Signed) RICHARD CHARLTON.

The little dog safely reached this country, and was given, we believe, to Mr. Bandinel. There have come also a box of birds; and besides the Californian collection already mentioned, several seeds and roots, a small Herbarium, chiefly formed, it would appear, in New Caledonia, and another from the Sandwich Islands, consisting of not more than three hundred species. These it is our intention to publish with all convenient speed. A subscription is now in progress for the purpose of erecting a monument to his memory in his native place: and we are sure that his name and his virtues will long live in the recollection of his friends.

W. J. H.

The space which the life of Mr. Douglas has occupied in these pages, combined with our desire that it should form an uninterrupted narrative, has occasioned a delay in the appearance of several brief botanical notices, and, what is of more consequence, some important Memoirs, which have been kindly communicated by valued friends, and to which we shall give place as soon as possible: amongst them may be mentioned, "Dr. Graham on the *Gamboge Tree* of Ceylon" (with a plate); "Dr. Christison (Professor of Materia Medica in the University of Edinburgh) on the Chemical and Commercial History of *Gamboge*;" "Notes upon some Genera and Species of *Orchideæ* in the collection formed by Mr. Drége at the Cape of Good Hope, by Dr. Lindley;" "A Memoir of the life of the late Mr. Richard Cunningham, Colonial Botanist in New South Wales" (with a portrait); "Ditto of Mr. John Fraser," to whom our gardens are indebted for the choicest productions of the United States" (with a portrait); "A Botanical Tour in Brittany, by Joseph Woods, Esq.;" "An account of several plants from the Sandwich Islands, by Dr. Asa Gray of New York;" "A specimen of the Botany of the Islands of New Zealand, by Allan Cunningham, Esq."

ILLUSTRATIONS OF INDIAN BOTANY.

By Dr. Wight and G. A. W. Arnott, Esq.

(Continued from page 72.)

INDIGOFERA HIRSUTA.

TAB. XXIV.

Annua v. biennis, erecta, ramosa, ubique (foliis exceptis) pilis mollibus patentibus tecta: foliis pinnatis, pinnis oppositis, 2—5-jugis, oblongo-obovatis, terminali longiori; supra parce subtus dense pilis appressis sericeis vestitis: stipulis longis setaceis: racemis densis pedunculatis, elongatis, pleruṁque folio longioribus, multifloris: floribus parvis: calyce profunde 5-fido, segmentis longitudine corollæ, subulatis, hirsutis: leguminibus imbricatim reflexis rectis 6—8-ties longioribus quam latioribus, 4-angulatis mucronatis villosis, 4—6-spermis: seminibus 4-gonis utrinque truncatis.

Indigofera hirsuta. *Linn. Sp. Pl. p.*

1862. *De Cand. Prodr. v.* 2. *p.* 228. *Spreng. Syst. Veget. v.* 3. *p.* 276. *Roxb. Fl. Ind. v.* 3. *p.* 376; *in E. I. C. Mus. t.* 385. *L. n.* 5450. *Wight, Cat. n.* 862. *Wight et Arn. Prodr. Fl. Penins. Ind. Or. v.* 1. *p.* 204. *Burm. Zeyl. t.* 14. *Rheed. Mal.* 9. *t.* 30.

Stems flexuose, erect, branched, round, striated, hairy, of a firm woody texture, and of annual or biennial duration. *Leaves* petioled, pinnate, varying in the number of leaflets; the specimens figured had three pairs; those now before me have four pairs and an odd one. *Leaflets* elliptic-oblong, mucronate, villous on both sides, but much more so below than above. *Colour* light-green above, whitish beneath. *Petioles* furrowed, drooping. *Stipules* very long, thread-shaped, hairy; a smaller one of the same kind appears at the base of each leaflet. *Racemes* spicate, five or six inches long, erect, with only a few flowers open at once. *Flowers* small, pale-reddish. *Calyx* five-parted, divisions subulate, a little shorter than the corolla, very hairy. *Corolla: Vexillum* erect, obovate, not bent back: *wings* and *keel* adhering together and deflexed from the stamens with an elastic jerk. A subulate spur is seen on each side near the base of the keel. *Stamens: Filaments* diadelphous, but the tenth not separating till after the fall of the corolla. *Anthers* short, broad, cordate, mucronate. *Pistil* and *Germen* short, hairy: *style* the length of the stamens: *stigma* subcapitate. *Legumes* pendulous, very hairy, four-angled, about the period of maturity the back is elevated into a keel, and terminated by a sharp black spine. *Seeds* four to six, separated by membranous partitions, truncated at the ends, four-sided, foveolated all over.

This annual or biennial plant is usually found in rich moist soils, near the margins of tanks (but is not confined to such places), and is in flower during the rainy and cool seasons. The fruit at the bottom of the racemes is often nearly ripe before the uppermost flowers have opened. It is one of the most distinct species of this genus.

Fig. 1. Flower laid open. 2. The same, the petals being removed:—*nat. size.* 3. Flower laid open:—*magnified.* 4. Legume:—*nat. size.*

WARDIA: A NEW GENUS OF MOSSES, DISCOVERED IN SOUTHERN AFRICA.

Tab. XXV.

Whilst herborizing in the rocky bed of a rivulet on Table Mountain, Cape of Good Hope, Mr. Harvey's attention was struck with the appearance of a Moss, growing in a situation precisely similar to that which is described as the station of *Scouleria aquatica* in North-West America, namely, on stones washed by the running stream; and he was still more surprised to find that it further agreed with that Moss in some of its more remarkable features, particularly in the firm union of the operculum with the columella, after the former has separated from the capsule. "It certainly is," as Mr. Harvey observes, "not a little remarkable that so obvious and so unusual a character should exist in two river Mosses, thus widely separated geographically, and only in these." Mr. Harvey's Moss, however, affords ample characters for the formation of a new genus, which I am permitted to join its discoverer in dedicating to N. B. Ward, Esq., an ardent promoter of Botany in all its departments, deeply attached to the study of Cryptogamiæ and of Mosses in particular: and who has laid open a new field to the philosophical inquirer, by his method of preserving living plants during long voyages, and of cultivating them in the midst of large cities in closed cases.[1]

WARDIA. *Harv.* and *Hook.*

Gen. Char. *Seta* lateralis et terminalis, elongata, spiraliter torta. *Capsula* ovalis, demum subturbinata. *Peristomium* simplex; e membrana brevi erecta, longitudinaliter transversimque striata, irregulariter fissa. *Operculum* ad columellam persistentem arcte adnatum. *Calyptra* dimidiata.—Muscus *aquaticus, habitu* Scouleriæ, *diversifolius* Seta *insigniter hygrometrica.*

Wardia *hygrometrica.* Harv. et Hook. (Tab. XXV.)

[1] See his very ingenious letter on the subject of his "Improved method of transporting living plants," at page 317 of vol. I, of this Journal.

HAB. On the stony bed of a small mountain rivulet, at Paradise, on the eastern side of Table Mountain, Cape of Good Hope. *W. H. Harvey*, Esq.

Caules laxi, 2—3 uncias longi, rigidiusculi, inferne simplices, denudati, apice ramosi, foliosi. *Folia* subsecunda, undique inserta, erecto-patula; *inferiora* ovato-lanceolata, breviter acuminata; *superiora* sensim majora, latiora, orbiculata, valde concava, acuminulata; omnia læte viridia, pellucida, enervia, integerrima. *Seta* terminalis vel (ob innovationibus ?) lateralis, semi-unciam longa, erecta, spiraliter torta, hygrometrica. *Capsula* ovalis, lævis, intense fusca, ore (cum operculo adnato) paululum contracto, demum latiori. *Operculum* conico-rostratum, rostro curvato, columella arcte adhærente. *Peristomium* simplex, rufo-fuscum, e membrana brevi truncata striata, longitudinaliter transversimque irregulariter fissa, laciniis subdentiformibus. *Operculum* (fide amiciss. Harvey) dimidiatum.

Fig. 1. Plants:—*nat. size.* 2. Apex of a fertile branch, with the Operculum separated from the mouth of the Capsule, but firmly adhering to the Columella. 3. Capsule, before the separation of the lid. 4. Section of a Capsule, the lid having separated. 5. Lid with the Columella. 6. Portion of the Peristome. 7. Lower leaf. 8 and 9. Upper leaves:—*magnified.*

BOTANICAL INFORMATION.

Letters have been received from Rio de Janeiro, dated July 27th, from Mr. Gardner, in which he says—"From the descriptions of Dr. Abel, Drs. Spix and Martius, and M. Auguste de St. Hilaire, I was prepared to find this a most delightful, as well as beautiful, country: but even the splendid pictures which they draw of it, fall far short of the reality. The entrance to the bay, with the many conical hills, and islands covered with the most luxuriant vegetation: the bay itself, as seen from an eminence behind the city, in which all the shipping of the world could ride safely at anchor—the mountains by which it is bounded on both sides, wooded to their summits with lofty trees, with the Organ Mountains in the distance to the eastward, form one of the grandest scenes imaginable. To a Naturalist it is a most interesting place. He cannot take a walk even in the suburbs of the town, but he finds growing around him on all sides, and even beneath his feet, the plants which he has been long used to see cultivated in hot-houses at home with so much care. Beetles are crushed at every footstep: the air is filled with beautiful butterflies and other winged insects—the chirping of grasshoppers is heard from the grass to an extent that is almost annoying: every road and wall abounds with lizards, and the incessant noise which they produce at night is any thing but pleasant to the ears of a stranger. In short, the whole country may be said to teem with life." With these attractions, and seeing around him numerous plants which are, as yet, in the Herbaria of few European Botanists, we need not wonder that Mr. Gardner should be tempted to remain a little time in so inviting a country. We think he has acted wisely in proceeding at once to the Organ Mountains, as he has done: and from thence he contemplates a visit to Minas Geraes. He will, by so doing, soon make himself master of the language which is so general over a great portion of South America, and will then determine what future route will give him the best prospect of success.

We are happy to have it in our power to announce another collector, who is gone to an equally interesting country, under the auspices of the Horticultural Society of London. Mr. Theodore Hartweg embarked for Mexico in the service of the Horticultural Society, to whom therefore all living plants, roots, and seeds will be sent: but that useful Institution has generously allowed him to dispose of dried specimens of plants on his own account, which he will do at the rate of £2 the hundred species. All applications, however, for shares must be made through the Horticultural Society, by letters addressed either to Mr. Bentham, or to Dr. Lindley. From the capital of Mexico, Mr. Hartweg will go to Guanaxato and proceed northward, as opportunity may offer, keeping as much as he

can to the Tierra fria. He will remain in the country two or three years, that is, if the state of it will admit of botanizing: but it is so disturbed, that he may probably have to take another direction and visit Bolivia, which presents a yet more interesting field. Whichever way he goes, we are authorized in anticipating great things from him.

Dr. Schomburgk has returned to Demerara from his arduous voyage on the Essequibo and its tributaries. The perils of such an undertaking none can estimate, except those who have visited similar countries; and the incessant rains and the want of competent assistance occasioned the destruction of a large portion of his plants; so that a very small number of species constituted the second *envoi*, despatched by Dr. Schomburgk: and we regret, though we are not surprised to learn, that some of the subscribers, disappointed in the character of this collection, have withdrawn their names as subscribers. We regret it, because, as our Government does not patronize and support, like those of the continental nations, similar expeditions in behalf of Natural History, it is quite certain that nothing can be done, but through the aid of private individuals, in furtherance of so good a cause. Nor are the subscribers required in the present instance to pay any thing in advance, but only for what they receive; so that after all, save in a very slight degree, by some of the specimens being in a less perfect state than could be wished, not any one suffers, except the unfortunate traveller, by his bad success, as is thus feelingly described by him in a letter now before us. "Mr. Bentham will have informed you before this time, what ill success has attended my collection of plants, and that the majority of what I have collected were spoiled by the incessant torrents of rain, and in consequence of the inattention of my assistant, whose neglect I found out too late. The very thought that my subscribers will be perhaps disappointed, is galling to me, and the loss to me in a financial respect is very serious. The last sets of the late expedition, consisting of only thirty-eight species, have just been despatched to Mr. Bentham, and some of them even have suffered by the dampness of the climate. I have now taken such precautions, that a similar accident shall not happen again, and I have great hopes that a Mr. Reiss is to accompany me, who is fully able to attend to that branch of Natural History, in case indisposition should prevent my being able to do so myself. The field for my next investigation will be the river Courantine, a country replete with interest, as its banks are a terra incognita to the Botanist. If God should please to grant me health and fair weather, I promise myself more interesting results than from my last expedition."

Mr. Nuttall is returned to the United States after a most interesting expedition across the Rocky Mountains to the shores of the Pacific at the mouth of the Columbia, and a voyage thence to the Sandwich Islands. We understand the journey has been a very successful one in point of botanical acquisitions, and the Rocky Mountains having been crossed considerably to the southward of Mr. Drummond's or Mr. Douglas' route, the character of the vegetation will be proportionably different, and we trust Mr. Nuttall is engaged in preparing an account of them for the press.

It gives us pleasure to be able to say that a botanical collector is about to proceed to Santa Fé, in North Mexico, under the auspices of Dr. Torrey of New York. He will accompany the Caravan, which leaves St. Louis (on the Missouri) about the end of May next, and will reach Santa Fé in about sixty-five days. The party will not return till October, thus affording the collector ample opportunities for drying plants, &c. His outfit is calculated at three hundred dollars currency. Those, who contribute to this, will receive plants at the rate of one hundred specimens for every five dollars. To those who purchase specimens on the return of the collector, without having contributed to his outfit, the price will be seven dollars per hun-

dred. Considering the highly interesting character of the country to be explored, and the difficulty of getting access to it (the whole journey to and from St. Louis having to be made on horseback), the terms are certainly extremely moderate. Should the collector give satisfaction to his employers in this expedition, it is their intention to send him to the southern parts of Florida and Alabama.

"MONOGRAPH OF NORTH AMERICAN CYPERACEÆ.—By John Torrey."

We have just received the loose sheets of this very important paper from our indefatigable and excellent friend, Dr. Torrey, and we regard it as the most valuable contribution made to American Botany of late years. The interesting tribe of plants of which it treats are, so far as North America is concerned, now made familiar by the joint labours of Torrey and Gray, and established with a precision, to which, through the admirable specimens in Dr. Gray's two volumes of the Gramineæ and Cyperaceæ, no other portion of the North American Flora can pretend. It is impossible, in the limits of this article, to do justice to the industry and sagacity of Dr. Torrey in this elaborate Monograph. He has made the inestimable writings of our great countryman, Dr. Robert Brown, the object of his especial study, adopting, with some modifications the classification of the learned Nees ab Esenbeck, one of the worthiest disciples of the immortal author of the Prodromus Floræ Novæ Hollandiæ.

Dr. Torrey exhibits a tabular view of the North American genera of Cyperaceæ, "arranged according to the Synopsis of Nees, with the number of species belonging to each genus, and the proportion which the endemic species bear to those which also inhabit Europe or other parts of the world." We cannot withhold the following interesting extract from his introductory observations :—

"Of the tribe *Cypereæ* the greatest proportion belong to the southern States. The genus *Cyperus* scarcely extends into Canada, and in New England seven or eight species only have been found. Proceeding South they become more frequent, and the maximum is attained about the Gulf of Mexico. *Kyllingia* does not occur North of Pennsylvania. *Mariscus* is found throughout the United States, and *Dulichium*, a doubtful member of this tribe, has an equally extensive range.

"*Hypolytreæ* constitute a small tribe. *Lipocarpha* is peculiarly southern, and *Fuirena* is rarely found so far North as Boston, and in the northern and middle States, only in the vicinity of the ocean. *Scirpeæ* are widely distributed, but at least two-thirds of the species occur South of Virginia. *Abildgaardia* and *Elytrospermum* have only been observed on the Pacific coast. The genuine species of *Scirpus* range from the Arctic regions to Florida, and from the Atlantic to the Pacific; and *Eleocharis* has a similar range. *Eriophorum* is a northern genus, only one of its species extending beyond Pennsylvania. *Chætocyperus* is peculiar to the South. *Fimbristylis* does not reach the northern limits of the United States. *Isolepis* is chiefly southern. Our solitary species of *Trichelostylis* occurs in nearly all parts of North America South of Canada.

"*Rhynchosporeæ* are, with few exceptions, southern plants. *Dichromena* is not found North of Virginia, nor far from the ocean. Two *Psilocaryæ* are southern, and a third has been observed only in Massachusetts. Of the twenty-eight species of *Rhynchosporæ*, but four are found as far North as Boston, and only eight belong to the middle States: the remainder are mostly peculiar to the southern States, but many of them extend West to Texas. Of the two species of *Ceratoschænus*, one inhabits a large part of the United States, South of Delaware, and West of the Mississippi; the other is found only in New England.

"The tribe *Cladieæ* is represented by two species of *Cladium*, one of which is northern, the other southern.

"Of *Sclerieæ* we have but two genera, and eleven species, two or three of which have an extensive range in latitude and longitude, but most of them are southern, and confined to the vicinity of the ocean.

"A solitary species of the small tribe *Elyneæ* inhabits the boreal regions of the Continent.

"The vast genus *Carex*, which almost exclusively constitutes the tribe *Cariceæ*, predominates in the northern parts of the Continent, and many of its species are peculiar to the boreal and arctic regions, but a large number inhabit almost every part of North America. Of *Uncinia* we have but a single species, a native of British America."

Of the genus *Carex*, Dr. Torrey enumerates one hundred and sixty-five species found in North America. He has reduced several of the species of Willdenow, Dewey, &c. to the rank of varieties. It is difficult in several of the groupes of this extensive genus to define species so accurately as to lead to an absolute certainty of distinguishing plants intimately allied in the form of the fruit and scale. This embarrassment has been felt and expressed by the accurate Wahlenberg, and authors will continue to differ on the subject of species and varieties.

Of the hundred and sixty-five species of *Carex* in North America, forty-seven are common to Europe and America, thirty-five are peculiar to the high northern latitudes, including the Rocky Mountains and North-West coast, leaving eighty-three belonging to the United States, from Texas to Canada. These numbers we have hastily summed up from Dr. Torrey's Monograph, as his tabular view has not yet reached us. We can only express a hope that this excellent Monograph will be published separately. At present it forms a most valuable article in the volumes of the Lyceum of New York.

The same accomplished Botanist who favoured us with his remarks on the state of Botany in Germany,[1] has kindly continued his communication in a letter, dated

"Vienna, Oct. 27th, 1836.

"We made," he says, "some alterations in our plans, in consequence of the impossibility of travelling in Italy with any comfort whilst there is so much cholera and quarantine—remained some time at Dresden and Carlsbad—went from thence to Munich, where we spent nearly a month, and are now settled at Vienna for the winter. At Dresden we had the pleasure of spending the greater part of every day with Humboldt, whose activity and extensive information about every thing that is going on connected with Geography and Natural History are really astonishing, and whose readiness of communication is not in the least diminished by the very high social position he holds. I do not think I ever knew a more agreeable man than he is, and always has been. He was on his way from Toplitz to Berlin. Of the state of Botany in Dresden itself I cannot say much. The Garden is like the second-rate botanical gardens on the continent, containing a tolerable proportion of common exotic plants, and a better collection of German plants than usual, with Reichenbach's names. Professor Reichenbach was exceedingly attentive to us, and considering that he has nearly all the year round daily lectures to deliver on all the branches of Natural History; that he superintends the arrangement of the Natural History Museum (by no means an indifferent one), and of the Garden; and that all the drawings for his works are made under his own eye, he must be allowed to be a laborious, active, and useful man. You know his 'Iconographia of Europæan Plants'—it is now definitively terminated with the eleventh part, consisting of one hundred and twelve plates,[2] and he is at present occupied with a 'German Fauna,' containing the same kind of accurate figures of animals that his 'Iconographia' does of plants. His intention is also to publish a complete series of figures of German plants, though he seems at present to be directing his attention generally rather to Zoology. His own collection is extremely rich, as may be supposed, in German plants. Kaulfuss' Herbarium (of Ferns) is in the neigh-

[1] See page 76 of the present volume, where his last letter, it will be observed, was dated "Dresden."

[2] These are wholly devoted to the Grasses, which are executed with great care.

bourhood, being in the possession of Count Röemer, near Meissen—but that is too far for ready consultation.

"After leaving Dresden, we spent about a fortnight in the so-called Saxon Switzerland and in Northern Bohemia, during which time I gathered a few things, but not of much interest—and, generally, the country was too much dried up by the long hot summer they have had. From thence to Munich the only botanical town we stopped at was Ratisbon, where we were chaperoned by Dr. Fürnroth, who in summer acts for Dr. Hoppe, the latter always spending that season at Saltzburg. I was very much surprised here to see the little *materiel* that belongs to a Society[1] which has certainly exercised very great influence on the progress of Botany in Germany. It is true that they have lost their president, Count de Bray, and that there is at present no resident member of any note, and their '*Flora*'[2] is consequently suffering in its interest; yet it is one of the first botanical societies in the country; and they possess but a very poor Herbarium, still tied up into Linnæan Classes, and a Library, rich perhaps in German publications on Botany, and a few valuable old works; but containing very few foreign, or illustrated, or other costly works, and only six resident members. Martius of Munich, however, who is much interested in the Society, seems to hope that arrangements will soon be made for raising it considerably above its present state.

"We arrived at Munich on the 11th of September. My friends Martius and Zuccarini had both left it some time before, and were now at their country houses in the mountains. But as rainy weather had set in, we determined to wait for them at Munich. We found Dr. Schultes, who shows that he would have distinguished himself highly amongst German Botanists, had he not been obliged, from motives of the most honourable kind, to follow up an already extensive medical practice. He hopes, however, to return to Botany some day or other, and in the mean time collects what he can. He gave me a number of interesting plants from the Bavarian and Tyrolese Alps; and also some very good Egyptian plants, which I had not previously received from the collections of Boué. These, which are extremely well dried, were gathered by a Dr. Fischer; who went out to Syria with Count Ostermann, but afterwards entered the service of the Pacha of Egypt, and has now been three or four years Professor at the Egyptian Institute of Abazabul. He lately had the opportunity of making an excursion into the Yemen (part of the time with Schimper,[3] who travels for the Unio Itineraria), and has just returned to Munich. He brings with him a collection of Yemen plants, said to be a fine one, but it was still in quarantine, at Trieste, when I left Munich. He has, however, determined to make up for sale á number of sets of about two hundred and fifty species, which he intends selling at about 20s. per hundred.

"Towards the end of September, the weather having again become beautiful, we made a tour among the Bavarian lakes, returned to Munich for the national fêtes in the beginning of October, and spent ten days again there with Martius very agreeably, and with Zuccarini. Martius is full of business. He has now the chief superintendence of the Botanical collections and garden, and Zuccarini is under him. He works chiefly at his Palms, which he seems very anxious to finish, and the printing of which is going on; but it costs him a great deal of labour. As soon as that is done, he intends continuing his Flora of Brazil, of which no more is yet published than the two parts you mention (Vol. I., part 2, containing the *Algæ*, *Lichenes*, and *Hepaticæ;* and Vol. II, part 1, containing the *Gramineæ*). Other Botanists, Endlicher, Schultes, &c. are assisting him, and I have promised to prepare for him some of those families in which I am more particularly

[1] Der Koeniglichen botanischen Gesellschaft in Regensburg.

[2] Flora, oder Botanische Zeitung, of which the first volume appeared in 1818.

[3] See page 4 of this volume.

interested: but the order in which he will publish them is not yet settled. He has just received a large case from his collector in Brazil, the contents of which will be offered to the public at the rate of about £2 the hundred, excluding the expenses to London: but he wishes to defer their distribution till he has named them, which he cannot do till his great work on Palms is finished. These collections are from Rio Janeiro, Minas Geraes, and thence towards the South. Martius strongly advises Mr. Gardner to penetrate from Pernambuco into the province of Piauhi, and thence into the mountains on the western boundary of that province, as being the district offering at once the richest, the most varied, and the least known vegetation in northern Brazil.

"Zuccarini is much engaged with a Monograph of *Cacteæ*, for which the garden of Munich affords rich materials, especially from Karwinsky's Mexican collection. The work is in a state of great forwardness, and the printing will, I believe, soon be commenced. With respect to Japanese plants, he has published four or five Fasciculi, and materials are prepared for three or four more. The publication of the Flora Japonica seems to be for the present postponed.

"The Greek plants collected by Berger are with Zuccarini, one complete set being deposited in the Museum. The Professor of Zoology at the Munich Academy has undertaken a journey to Syria and Palestine, partly for the sake of Natural History. When I was at Munich he was at Constantinople, on his way to Jerusalem, and had with him two young botanical collectors.

"At Vienna only one volume of Host's Salices has been published. Of Schott's Genera of Ferns,[1] four parts have appeared. Of the Melebrémata[2] only one Fasciculus. The "Atakta," by Endlicher, will be finished with one more part. But I will give you a detailed account of this author's labours in my next. In the mean while you will probably be much interested by the first part of his Genera Plantarum[3] just published. It contains all the Cryptogamia and the commencement of the Monocotyledones.

"A person of the name of Frivaldski has collected some good plants in the Turkish mountains, and offers sets, I am told, of between two hundred and two hundred and fifty species, for about £2."

"Vienna, Nov. 25, 1836.

"I am now settled to work here for the winter, and really it is a pleasure to do so in a Herbarium, already so extensive, and conducted under such liberal management as the Imperial Herbarium is. After the deaths of Dr. Pohl and Trattinick, who were respectively keepers of the Brazilian Museum, and of the general Herbarium at the Imperial Cabinet of Natural History, the Government were induced to unite both collections, and to give M. Endlicher the charge of the entire botanical portion, with Dr. Fenzl as his assistant, and three young men to work under their superintendence. After this arrangement had been completed, M. Endlicher presented to the Museum the whole of his own Herbarium. The sum allotted for the expenses of the botanical department is sufficiently liberal to enable them to subscribe to all collections of real interest. The whole Herbarium now therefore consists,

"I. Of Portenschlag's Herbarium, containing chiefly garden specimens, and the plants of Germany, Dalmatia, and Sicily.

"II. Ferdinand Bauer's Australian collections.

"III. A most complete set of Sieber's plants.

"IV. A very general collection from Endlicher's correspondents.

"V. Sets of the plants gathered by most of the collectors who have been sent out during the last few years.

[1] This work contains admirable illustrations of the generic characters of the Ferns, with brief descriptive remarks.

[2] Noticed at page 161 of our "Botanical Journal."

[3] "*Genera Plantarum methodo naturali dispositæ; auctore Stephano Endlicher.* Vienna."—This important work, in imperial 8vo., double columns, will form one large volume, to be delivered in ten parts; and the completion is promised at Michaelmas, 1837.

"VI. Pohl's entire Brazilian Herbarium, which is the most valuable part of all. The assistants are now actively engaged under Endlicher's own eye, in arranging and fastening down and incorporating into one, these several Herbaria, according to the natural system.

"I have already gone through the *Labiatæ*, and am now engaged in studying the *Leguminosæ*, with the view of giving, in the *Annals of the Museum* here, a *Memoir on the Brazilian Leguminosæ*, with descriptions of a number of new genera and species, and a general enumeration of all the genera in this Order, together with the synonymy of Meyer's and Ecklon's new Cape genera, and descriptions of some remarkable ones among Bauer's New Holland, and Bojer's Madagascar plants. Several of the genera are done, and I have prepared descriptions of some highly interesting Brazilian genera, but shall now probably lay aside this Memoir for a short time, that I may assist Endlicher in the publication of the '*Plantæ Hügelianæ.*'

"It is possible you may have already seen in some literary journal a more detailed account of Baron Hügel's travels than is generally known; but in case you should not, I here translate an article from the *Augsburg Allgemeine Zeitung*, of the 17th instant.

"'Baron Charles von Hügel left Toulon in the spring of 1831, visited Greece, Cyprus, Syria and Palestine, Egypt, Nubia, and Arabia, and reached Bombay by the steam-boat, in the year 1832. He left no remarkable point of the West coast of the Indian Peninsula untouched, and passing through the varied territory of the Deccan and Malabar coast, reached Cape Comorin. Thence he crossed over to Ceylon by the 'Adam's Bridge,' exploring the little interior of this island, so rich in the monuments of the Buddha religion, for the space of four months, and then returned to India, where he proceeded along the Coromandel coast to Madras. At this point he embarked for the islands of the Indian Archipelago, and visited the Malayan Peninsula, Sumatra, Java, and some of the smaller isles, and sailing through the Straits of Sunda, arrived at Swan River, on the West coast of New Holland, towards the close of the year 1833. Having examined this new colony, Baron Hügel took shipping to King George's Sound, and thence to Van Diemen's Land. After a few weeks' stay at each of the latter places, he came to Sydney, the capital of New South Wales, a country which seems to have presented peculiar attractions to our traveller, as he crossed and explored it in every direction, extending his researches to the utmost limits of the colony. After visiting New Zealand and some islands of the Pacific Ocean, the Baron bent his course through the groupes of the Carolina and Ladrone Islands to Luçon, and Manilla, the capital of the Philippines, where he spent four weeks travelling over the island, and in the beginning of the year 1835, went to Canton. His stay at the latter place and at Macao was prolonged to six weeks, after which he embarked for Madras, making, on his way thither, short visits to Singapore, Malacca, and Penang. From Madras he took the steam-boat for Calcutta, and some weeks afterwards, by the same conveyance, proceeded up the Ganges to Benares, Oude, the ancient Onodeya, Lucknow, Carempur, Allahabad, Agra, Gwalior; Bhurtpur and Delhi were next visited; and in the end of June our adventurous and indefatigable traveller reached Mansuri in the Himalaya district. He devoted three months to these mountains, and the close of September saw him crossing the Sutledj and quitting British India, his course was pursued over the lower chain of mountains to Radhauri; whence, passing over the higher chain, he reached the valley of Cashmeer. After exploring this country in several directions, and ascending the loftier passes into Thibet, he turned towards Attok on the Indus. Lahore, where Rungjeet Sing holds his splendid court, was the next interesting point which attracted Baron Hügel's attention, and quitting it in January, 1836, he again crossed the Himalaya Mountains, and returned to Delhi. Thence, through

the Rajpoot States, Jeypur, Ajmier, Tschitor, Udipur, and through Abu Ahmesabad, and Surat, he arrived at Bombay in May, and sailing from this port on the 8th of June, after touching at the Cape and Saint Helena, and encountering a most stormy passage, he arrived in London on the 18th of October.'

" So far the Augsburg Gazette.—Baron Hügel remained ten days in London, where I understand that he entered into some terms for publishing his works with Arrowsmith and Murray, and after passing a few days at Paris, is come hither. He arrived yesterday; I saw him last night, and this morning Endlicher arranged with him, and then with me, the general outline of a work in which we are to describe, at least, the two most important parts of his Herbarium, viz. the Swan River and the Lahore collections. The former portion was accordingly sent to the Imperial Herbarium this afternoon, and to-morrow morning we set to work; so that not much time will be lost. It is our intention to imitate, in some measure, the plan of your 'Botany of Captain Beechey's Voyage,' giving about fifty plates of Swan River plants, and perhaps as many of Lahore ones; and we hope to get the former in a state of great forwardness by the end of the year.

" Endlicher's works, concerning which you inquire, consist of a *Flora Posoniensis* (of Presburg), a small local Flora, of consequently limited interest, but extremely well executed.—The '*Meletemata,*' first Fasciculus by Endlicher and Schott (the *Sterculiaceæ* in it are entirely by the latter hand, so that Endlicher does not wish to have his name given to the new genera, as has sometimes been done by mistake).—'*Atakta Botanica,*' by Endlicher alone, of which five Fasciculi have been published, and a sixth will complete the volume, and probably the work. (In the fifth Fasciculus is a figure of *Ungnodia*, the new Hippocastaneous genus,[1] from Drummond's Texas specimens.)—'*Prodromus Floræ Norfolkiceæ,*' in which the descriptions are exclusively Endlicher's, and not Bauer's, as I believe[2] you mentioned erroneously in the Botanical Miscellany or Journal, for Bauer only left the specimens and drawings, without any *MSS.* — '*Nova Genera et Species Plantarum Chilensium,*' which he publishes in conjunction with Pöppig, the first volume is complete, and a second will probably terminate it.—'*Lertum Cabulicum,*' an account of a few Cabul plants; Endlicher is assisted here by Dr. Fenzl—one part only is out, and there will be but two or three more.—And the '*Genera Plantarum,*' of which you probably possess the first part—the second is in a state of considerable forwardness.

" Martius is concocting a plan for publishing a '*Flora Brasiliensis,*' with the assistance of various Botanists; but has relinquished the idea of making it so detailed, and with such numerous observations as are already given in the two volumes that have appeared, on account of the too great length of time and space which they would occupy."

We are gratified in being able to state, that two highly interesting plants have been added to the British Flora during the last summer; *Calamagrostis Lapponica* and *Carex rupestris:* the former was discovered on an island of Lough Neagh, Ireland, by Mr. Moore (the same locality in which the *Carex Buxbaumii* was found by the same zealous Botanist. See p. 307); the latter, *Carex rupestris,* in Aberdeenshire, by Mr. Dickie and Mr. Templeton " on shelves of rocks extending from the small round lake at the top of Glen Callader eastward to the break-neck fall, growing with *Salix reticulata* and *Carex atrata,* and frequently among *Didymodon capillaceus* and *Carex acuta.*" Dr. Alexander Murray of Aberdeen has kindly communi-

[1] To this plant I had directed the attention of the subscribers to Mr. Drummond's collections as " a remarkable new hippocastaneous genus." It forms a large tree. The specimens were distributed with Mr. Drummond's first Texas collection. Ed.

[2] Probably my excellent correspondent had the publication of some other author in view. In my notice of this work (Bot. Journal, p. 163) I have mentioned it as " from the pen of Mr. Endlicher, aided by the truly masterly drawings of Mr. Ferdinand Bauer." Ed.

cated to me the above station, together with specimens, which, though young and imperfect, leave no doubt in my mind with regard to the species.

Dr. Boott also informs us that in the Smithian Herbarium, deposited in the Linnæan Society's apartments, there exist specimens of the true *Carex punctata* of Gaudin (Agr. Helv. 2. p. 152, and Flora Helvetica, v. 6. p. 106. t. 2.), which had been gathered many years ago, by Mr. Dawson Turner at Beaumaris. Mr. Wilson has since found the same plant at Warrington. In both cases it had been mistaken for *C. distans*.

The third fasciculus (of fifty species) of Mrs. Wyatt's "*Algæ Danmonienses*" is ready for distribution. As soon as our copy reaches us we shall give an account of the contents, which indeed we have reason to know are neither less valuable nor less beautiful than those of the preceding parts.

DRÉGE'S PLANTS OF SOUTH AFRICA.

We formerly announced the offer for sale of sets of South African plants of Ecklon and Zeyher, and we now find another ample collection from that highly interesting country announced in the German Journals. The travels of M. J. F. Drége extended very far into Southern Africa, even to Port Natal on the Omgeni River. He investigated, botanically, various portions of that extensive district, ascending the Witberge, the highest mountain of that quarter, which attains an elevation of eight thousand feet above the level of the sea. The result of his journeyings has been the formation of a collection, of about two hundred thousand specimens, including nearly eight thousand species: and all this has been done without any assistance from the government, but entirely by his own individual exertions. These collections will be disposed of as soon as the Commentary upon them, which is preparing by Professor E. Meyer of Konigsberg, is published: and they are offered to Botanists on the following conditions:—

1. Every one can purchase specimens to what extent he pleases; but those who take few will pay proportionably more.

2. The species of each number of the commentary will constitute a separate collection.

3. Those who take an *entire* collection, will pay within the first four months after the publication of each number, eight dollars currency the hundred; but after that period, ten dollars. He who takes less than an entire collection, gives for every tenth part half a dollar the century more.

4. The distribution will be made according to the date at which the commissions are received. But as there are more of some plants than of others, those who delay sending their orders must not complain if they do not receive all that they order.

5. No charge to be made for packing.

6. All letters, conveyance of money, and carriage of plants, to be at the expense of the purchaser.

7. The money to be paid in advance either to M. J. F. Drége, Konigsberg, Prussia, or to Mr. Voss, bookseller, Leipzig, &c.

Some idea of the extent and importance of this collection may be formed, when it is mentioned, that the first Fasciculus of the commentary contains five hundred and forty-one *Leguminosæ*, with many new genera, and a large proportion of new species.

The first part of a beautiful and highly interesting work has just been communicated to us by the kindness of M. Endlicher, entitled, "*Sertum Cabulicum*, Enumeratio Plantarum quas in itinere inter Dere-Ghazee-khan et Cabul, mensibus Majo et Junio 1833, collegit Dr. Martius Honigberger: accedunt Novarum vel minus cognitarum Stirpium Icones et descriptiones auctoribus Stephano Endlicher et Edwardo Fenzl." The first Fasciculus contains ample generic and specific characters, with observations, and beautiful figures with copious analyses of the following plants—*Plantago penicillata, Silene* (*Saponaria*) *Honigbergeri, Dais spicata*, et *Scabiosa Olivieri*.

ILLUSTRATIONS OF INDIAN BOTANY.

By Dr. Wight & G. A. W. Arnott, Esq.

(*Continued from page* 183.)

HYDROLEA ZEYLANICA.

Tab. XXVI.

Inermis, foliis lanceolatis glabris, floribus axillaribus racemosis, calyce glanduloso-piloso.

Hydrolea Zeylanica. *Vahl, Symb.* 2. *p.* 46. *Willd. Sp. Pl. v.* 1. *p.* 1327. *Spreng. Syst. Veget. v.* 1. *p.* 865. *Rœm. et Schult. Syst. Veget. v.* 6. *p.* 192.

Nama Zeylanica. *Linn. Sp. Pl. p.* 327. *Fl. Zeyl. p.* 117. *t.* 2.

Steris Javana. *Linn. Mant. p.* 34.

Steris aquatica. *Burm. Ind. p.* 73. *t.* 39. *f.* 3.

Attalerie. *Plukn. Alm.* 22. *t.* 130. *f.* 2.

Isgera. *Vallel. Rheed. Mal.* 10. *t.* 28.

Herbaceous. *Stems* erect, towards the extremities variously bent, decumbent, and sometimes rooting near the base, round, glabrous, somewhat flexuose. *Leaves* short, petioled, lanceolate, rather obtuse, smooth, bright green above, below marked with numerous prominent parallel veins. *Racemes* axillary, somewhat leafy, spreading, few-flowered; every part of them, raches, pedicels, and calyx glanduloso-pubescent.[1] *Pedicels* one-flowered, usually opposite to a small bracteal leaf; but sometimes a little either above or below the opposed leaf, rarely axillary. *Flowers* deep blue, with a white spot in the centre. *Calyx* five-parted; divisions lanceolate, acute, nearly as long as the corolla, thickly covered with glandular hairs. *Corolla* wheel-shaped; *tube* short; *limb* five-cleft; divisions obtuse, spreading, or even somewhat reflexed when fully open. *Stamens* five, alternate with the segments of the corolla. *Filaments* the length of the tube, attached to it by a dilated base. *Anthers* large, sagittate. *Pistil: Germen* superior, two-celled: *Styles* two, diverging, about the length of the stamens, dark-blue, with paler capitate *stigmas*. *Capsule* inclosed in the permanent calyx, two-celled, many-seeded: *Seeds* growing all round a large fleshy receptacle, which forms part of the partition.

This plant inhabits water, or marshy ground throughout the rainy and cool seasons, flowering about January. When it grows in or close by water, its branches frequently shoot across it, floating like those of aquatic plants. Its numerous bright-blue spreading flowers, added to the locality in which it was growing, made me suppose, the first time I saw it, that it was the *Veronica Beccabunga*. When floating I have seen it several feet long.

The leaves beaten into pulp, and applied as a poultice, are considered efficacious in cleaning and healing ill-conditioned ulcers, particularly those in which maggots have begun to breed.

Fig. 1. Corolla laid open. 2. Calyx laid open, including the Pistil:—*magnified.*

[1] Such is the case also with Dr. Wallich's continental specimens (Cat. n. 4398), but our Ceylonese plants from Col. Walker, have all these parts perfectly glabrous.—Ed.

REMARKS ON THE GAMBOGE TREE OF CEYLON, AND CHARACTER OF HEBRADENDRON, A NEW GENUS OF GUTTIFERÆ, AND THAT TO WHICH THE TREE BELONGS.

By Robert Graham, M.D., Professor of Botany in the University of Edinburgh.

Tab. XXVII.

There are, in tropical countries, many plants which yield a yellow juice, so nearly resembling Gamboge in external characters, and it is said, even in medical properties, that they have each obtained in their respective countries, the name of Gamboge Plant. These belong to exceedingly dissimilar families, their products are never exported from the countries in which they grow, and they are therefore known not to yield any part of the *Gamboge* of commerce. It has been much doubted, however, whether this is the produce of one plant only, and those Botanists who believe that it is so, differ in opinion as to what that plant is.

Modern Naturalists think this substance is obtained from a plant belonging to the

Natural Family of *Guttiferæ*, and they generally differ only in believing, either with Murray, that this plant is *Stalagmitis cambogioides;* or, with De Candolle, that it is *Garcinia Cambogia* (See *Essai sur les Proprietés Médicales des Plantes*, p. 105). Murray's opinions were founded upon certain MSS. by König, and the examination of a specimen collected by him, both of which were in the possession of Sir Joseph Banks, by whose liberality he was allowed to publish his observations, which appeared in 1789, in the ninth volume of the *Commentationes Societatis Regiæ Scientiarum Göttingensis.*

The Authors of the British and several of the Continental Pharmacopeias, have adopted Murray's opinions; but in a paper, read to the Royal Society of Edinburgh, March, 1836, I stated my belief that this acquiescence had been somewhat too hasty; and my belief was founded on the examination of flowering specimens and drawings, with observations made in Ceylon, most obligingly communicated to me by Mrs. Col. Walker, and on the examination of a specimen in fruit transmitted by Mr. Blair to the late Dr. Duncan, now in the Materia Medica Museum of this University.

All the *Gamboge* of *Commerce* is exported, as it appears, from Singapoor, and believed to be obtained from Siam. The observations of König were made in Ceylon, and during a short stay in Siam,—but chiefly at the former place, where his specimens must have been gathered; for Murray informs us that all his information in Siam was derived from a Roman Catholic Priest, who gave him a very imperfect description of the tree, and that König himself had never seen it alive, and had not even an opportunity of verifying the meagre description (*descriptio proletaria*) of his informant by procuring a single twig. Out of these materials, however,—viz., the said description, the observations of König made in Ceylon, and portions of a specimen in the Banksian Herbarium, transmitted from thence by König,—does Murray construct the character of his genus *Stalagmitis*, and define his species *cambogioides.* Murray's description is, in some respects, wholly at variance with the only tree which, in Ceylon, yields a matter having all the properties, and answering all the purposes of *Gamboge;* yet in Ceylon, as I have said (I presume from Murray's testimony), König's specimens must have been obtained. Indeed we have another authority than that of Murray for this belief; König himself gives his plant the Singhalese names of *Ghokkatu, Gokathu*, or *Ghotathu*, and *Kanna Ghoraka*, yet there is nothing so easy as to show that the description of *Stalagmitis* by Murray is inapplicable to this plant.[1]

The specimens which I possess of the Ceylon tree and its product, and the characteristic drawings with which these are accompanied, together with the information I have obtained regarding it, I owe entirely to the great kindness of my most intelligent correspondent, Mrs. Col. Walker; who, conjointly with her husband, is profiting with equal zeal, judgment, and success, by the ample opportunities which they enjoy of cultivating an acquaintance with the Botany of that rich and interesting island, Ceylon. It will give value and authority to these observations, if I make some extracts from Mrs. Walker's letters, in which the tree, in conformity with previously received opinion, is called *Stalagmitis cambogioides,*—and I shall afterwards state what the tree really is.

In her first letter, dated Colombo, 1st July, 1833, Mrs. Walker says, "I have set about the *Stalagmitis cambogioides*, which is at present in fruit, and have drawn a branch, with a section of the fruit. I have likewise procured some Gamboge from the tree; it is brilliant and excellent. It is obtained from two other trees here, the *Garcinia Cambogia* and an unknown tree, which Col. Walker thinks is a *Gar-*

[1] These observations regarding the origin of König's specimens, were written before I had the direct testimony of Mr. Brown. In a letter, dated Aug. 3, 1836, which I shall presently quote again, he writes, "*Stalagmitis* of Murray, as you well know, is entirely formed from König's MSS., and a portion of his specimens or rather of one of his specimens, and these specimens, as well as the descriptions, belong to the plant of Ceylon."

cinia likewise. Specimens from both I shall send you, and drawings[1] also. The fruit of *G. Cambogia* is much used by the natives in their curries; and I am told, when quite ripe, is a very fine fruit, as large as the *Mangosteen,* which it resembles in form. The native name is *Goraka.* The fruit of *Stalagmitis cambogioides* is much smaller, very sweet when ripe, and by no means disagreeable in flavour. It is called here *Kana* (or eatable) *Goraka.* I have not yet ascertained all the uses made here of Gamboge, but it is certainly employed as a pigment by the native artists. Our servants say it is also used by native practitioners in medicine, and sometimes as a plaster, when first taken from the tree. It does not appear to exude like a gum, but on an incision being made, it issues freely through the pores of the bark, as I saw yesterday on cutting both the *Stalagmitis cambogioides* and *Garcinia Cambogia.* I have been trying it as a paint to-day, and find it as good as any I ever used.[2] We have no intercourse whatever with Siam, and I fear I can procure you no information from thence. I should think, from the specimen I have already got, that the matter which exudes from the *Stalagmitis cambogioides,* when an incision is made in the bark, is undoubtedly pure Gamboge. I have used it in colouring some of my flowers: it is quite liquid when it issues from the pores of the tree, but soon hardens when exposed to the air. I have not tried the stuff from the *Garcinias,* but it tastes and smells exactly like Gamboge."

Mrs. Walker's next letter is dated Aug. 20, 1834:—she says, "Your letter of February 1833, in which you first mention the subject of Gamboge, I received in June of the same year, and immediately inquired about the plant, which I found to be in fruit. In that state I drew it to the best of my abilities, but put off sending it to you till I had an opportunity of forwarding also, a representation of the flower, which, as many plants here blossom twice in the year, I hoped I might not have long to wait for. However, I was mistaken in this; the tree did not blossom till March, 1834. I drew it then, but have not since been able to send it home, not a single ship having sailed from hence to England during that long interval; and, I fear, after all, that you will consider my drawing incomplete, as it is only the barren flower I have had the means of representing. So at least it seems to me, and I got quantities of the blossoms, and examined a great number, and found them all the same. I shall send you specimens for your own examination; but I am sorry to say, they look very shabby and poor. The flower, however, in its best state, is insignificant, and poor-looking. The tree does not grow abundantly nor luxuriantly in the immediate neighbourhood of Colombo. Last January we took a little excursion, and got quite into a forest of *Stalagmitis cambogioides,* and perceiving all the trees had their bark cut off in various places, I concluded the people in the neighbourhood must be in the habit of collecting the gum, and determined to get all the information I could on the subject, for your edification. From a very intelligent native practitioner in medicine, I gained the following:—He told us that Gamboge from the *Stalagmitis,* called by the natives *Gokatu,* or *Kana Goraka,* is generally used by them, both as a pigment and medicinally. For the former purpose it is ground very fine with lime-juice,[3] and mixed with a pretty strong solution of the gum of the *Wood Apple* (*Feronia Elephantum*), called in Singhalese, *Diwul.* With the addition of a lit-

[1] I have received excellent drawings of *Garcinia Cambogia* (Willd.), of *Garcinia Cambogia, β.* (Moon), and of the unknown plant alluded to, together with specimens of the two first, but none of the last, which seems a species of *Carallia.* R. G.

[2] In a note on the back of the drawing, Mrs. Walker says, "It issues from an incision in a thickish liquid state, and of a light yellow colour, but soon hardens when exposed to the air, and becomes of a much deeper hue, and is perfectly fit for use in water-colour drawings, as much so as any I ever purchased, which was prepared and sold in the London colour-shops."

[3] In a recent letter to Dr. Christison, Mrs. Walker says that she finds this to be a mistake. As a yellow pigment, the juice is used without any preparation; the addition of lime juice injuring the colour—an observation which Dr. C. has confirmed by experiment.

tle Chunam, or Lime, they make a deep orange-colour, both tints being much used in the decoration of their temples, and Boodh himself is always represented in yellow garments. Yellow is indeed the sacred colour, the priests being invariably arrayed in yellow robes.

"As a medicine, the Gamboge is ground to a fine powder, and being mixed with the juice expressed from the leaves of the Tamarind Tree, is taken with a little water. This is the most common mode of administering it as an aperient; but when mixed with other ingredients it is considered by native practitioners to be beneficial in many diseases. It is collected by cutting pieces of the bark completely off, about the size of the palm of the hand, early in the morning. The Gamboge oozes out from the pores of the bark, in a semi-liquid state, but soon thickens, and is scraped off by the collectors next morning without injury to the tree, the wounds in the bark readily healing and becoming fit to undergo the operation again. The learned doctor, who gave us this information, presented us with a large pot or jar of Gamboge, and promised to send us more, which promise he faithfully kept, and I shall forward specimens to you of his present by the first opportunity. The *Garcinia Cambogia*, of which I transmit you a representation, is one of the most common trees in this neighbourhood, attaining a large size, and is very handsome, with remarkably thick and dark foliage. A quantity of resinous juice proceeds from its bark, in the same manner that Gamboge does from the *Stalagmitis;* but it never seems to harden thoroughly, and no use is made of it by the natives. The outer husk of the fruit, however, is a favourite ingredient in their curries. They prepare it by taking out the pulp and seeds, breaking it to pieces, and putting it in a heap, which is covered for two or three days, till it becomes soft. It is then smoked by burning cocoa-nut shells below the grating on which it is spread. This operation is continued for many days, when it is tied up tight in a bag, and kept for use by being hung, I cannot say in the chimney, for chimneys they have none,—but where it is under the influence of the smoke from their fires when cooking. They also use it in pickling or preserving, along with salt, a kind of small fish, which cured in this way will keep for six or seven months. The flower of No. 2, which I suppose is also a *Garcinia*, differs much from No. 1, but the fruit appears almost the same, and is used by the natives in the same way. They are indiscriminately called Goraka by the Singhalese, but are distinguished by their colour."[1]

In a subsequent letter, dated January 2, 1835, Mrs. Walker says, "I am convinced *Stalagmitis* produces true *Gamboge.* Dr. Pitcairn is of the same opinion, and desires me to tell you that he has administered it in the same way as it is used medicinally at home, and found its effects precisely the same."

I shall now state what the plant seems to be which is called by Mrs. Walker *Stalagmitis cambogioides*, and what are my reasons for forming the opinion which I entertain.

Linnæus, in his *Flora Zeylanica*, No. 195, under the name *Cambogia*, quotes as a synonym, "Carcapuli Acostæ, fructu malo aureo simili," of Plukenett's *Almagestum Botanicum;* which, if it be the same as the twig figured by Plukenett in his *Phytographia, t.* 147, *fig.* 3, seems to me to be *Xanthochymus ovalifolius.*

In the same work, Linnæus also quotes, as a synonym of his Cambogia, the "Arbor Indica, quæ gummi guttam fundit, fructu acido sulcato mali magnitudine" of Commelyn's *Flora Malabarica*, which is certainly "Coddam-pulli" of Rheede in *Hortus Malabaricus*, *Mangostana Cambogia* of Gærtner, *Garcinia Cambogia* of Desrousseaux and of De Candolle.

Linnæus lastly, in the same work, cites as a synonym for his *Cambogia* "Carca-

[1] No. 1. I believe this to be *Garcinia Cambogia*, Willd., which is *G. affinis* of Wight and Arnott, certainly not of Wallich. No. 2 is probably a *var.* of *G. Kydia* of Roxb., perhaps his *G. purpurea;* but as Roxb. gives no description of *G. purpurea*, the point cannot be determined. It is, no doubt, the *G. Cambogia β.*, or Red Garcinia, of Moon's Catalogue. R.G

puli Acostæ, arbor Indica gummi guttam fundens, fructu dulci, rotundo, cerasi magnitudine," of Burmann's *Thesaurus Zeylanicus*, which, I think, is certainly *Mangostana Morella* of Gærtner, *Garcinia Morella* of Desrousseaux and De Candolle, and, as certainly, *Stalagmitis cambogioides* of Moon's Catalogue of Ceylon Plants, and of Mrs. Walker; but by no means the "*Carcapuli*" of Acosta in his *Tractado de las Drogas*, p. 356; which seems to be *Carcapuli Acostæ* of *Pluk. Alm.* 81, *Garcinia Cambogia* of Desrousseaux.

It would probably be thought tedious and useless to follow the contradictions of authors regarding the identity of these plants, and that which yields Gamboge, from 1748, when the *Flora Zeylanica* was published, to the present day. I shall therefore pass them all over, until I come to the latest. In the excellent "*Prodromus Floræ Peninsulæ Indiæ Orientalis*," published by my friends, Dr. Wight and Mr. Arnott, in 1834, it is stated that *Stalagmitis cambogioides* (of Murray) is a species of Garcinia, and perhaps identical with *Garcinia Cochinchinensis* of Choisy, *Oxycarpus Cochinchinensis* of Loureiro. The whole of the account given by Murray of his *Stalagmitis* appeared to me, at the time I communicated my observations to the Royal Society, so enigmatical that I felt unable to form an opinion as to what it is; but I expressed my fears that the statement of Wight and Arnott only threw out another temptation to blunder; for Murray says, that in his plant, the flowers are arranged on a common footstalk, generally more than an inch long, in the axils of the leaves, jointed and bearing the pedicels, which are twice the length of the flowers themselves, in verticels at the joints, and that the fruit is globular, white, slightly reddened on one side, and sometimes twice the size of a large cherry; while Loureiro and Choisy describe their plant as having clustered nearly sessile flowers, with a pear-shaped reddish-yellow fruit, two inches in diameter. Wight and Arnott further say, that the *Stalagmitis cambogioides* of Moon is the *Xanthochymus ovalifolius* of Roxburgh; but Roxburgh describes his plant as having a three-celled ovary, a fruit as large as a small apple, while the genus is partly characterized by the flowers having five petals, and by the presence of five large truncated glands, alternating with the fasciculi of stamens. On the other hand, Mrs. Walker's drawings, and specimens of the fruit sent by Mr. Blair to Dr. Duncan, show that this, like the fruit of *Garcinia Morella*, is four-celled, and not larger than a cherry; and in the specimens which Mrs. Walker has sent to me, I never find more than four petals, and cannot see a trace of these glands. I only mention these circumstances now, to show the inextricable confusion in which the subject lay, and in which it would have remained, had it not been for Mrs. Walker and the kindness with which Mr. Brown attended to my request that he would examine the specimens of König in the Banksian Herbarium. This examination has reconciled most of the contradictions of authors in a way which could hardly have been anticipated; the authoritative specimen of König is a compound, and consists of the flowers of *Xanthochymus ovalifolius*, with what seems the branch, leaves, and fruit of the plant which in Ceylon yields Gamboge. I give authority to this statement by quoting the letter of Mr. Brown. "The plant sent pasted by König to Sir Joseph Banks, as one specimen, I have ascertained to be made up of two plants, and very probably of two genera. The union was concealed by sealing wax. The portion in flower, and which agrees in structure with Murray's account, is, I have no doubt, the *Xanthochymus ovalifolius* of Roxburgh. *Stalagmitis* and *Xanthochymus* are therefore one genus, as Cambessèdes has already observed, giving the preference to the earlier name of Murray. This, however, forms but a small part of the whole specimen, the larger portion being, I am inclined to think, the same with your plant, of which I have seen, and I believe still possess, the specimen you sent to Don.[1] The structure, however, of this greater portion cannot be ascertained from the few very young flower-buds belonging to it. It approaches also very

[1] One of those received from Mrs. Walker.

closely, in its leaves especially, to that specimen in Hermann's Herbarium, which may be considered as the type of Linnæus' *Cambogia Gutta*. A loose fruit, pasted on the sheet with König's plant, probably belongs to the larger portion, and resembles Gærtner's *Morella*."

It appears then that the generic name of *Xanthochymus* must be dropped, and that the species which belonged to this genus must receive the appellation of *Stalagmitis*. It seems too, that the generic character of *Stalagmitis* by Murray, so far as regards the flower and inflorescence, was not taken from the plant he meant to describe, but from the flowers of *Xanthochymus* (*Stalagmitis*) *ovalifolius*, which König had inadvertently fastened to it; and lastly, that it is not known that any specimens of the flowers of the plant which Murray meant to describe, at least not any sufficiently perfect for examination, had been received in Europe, till those arrived which I owe to Mrs. Walker. The examination of these, proves that the plant is no *Stalagmitis*. It differs wholly in the number of the parts of the flower and cells of the fruit, in the structure of the calyx, corolla, and stamens; in the absence of intervening glands between the stamens, in the structure of the leaves, in the appearance of the fruit, and in the structure of the persistent stigma. While I remain quite certain that this plant is the *Garcinia Morella* of Gærtner, an opinion which was first formed from an inspection of the specimen in fruit from Mr. Blair, the examination of Mrs. Walker's specimens has induced me to remove the plant from the genus *Garcinia*. The structure of the stamens is quite peculiar, and quite unlike that of any species of *Garcinia* with which I am acquainted, in which the free portion of the filament is thread-like, and the anther bilocular, opening longitudinally. In Mrs. Walker's flowers, on the contrary, the free part of the stamens is thick and clavate, and the anthers open by the complete circumcision of a singular umbilicate, flat, and terminal lid, the elliptical pollen-granules being immersed in cellular substance.

For these reasons, I cannot hesitate in believing that the Gamboge plant of Ceylon belongs to a nondescript genus, characterized especially by the stamens, which have suggested the name of *Hebradendron*. Having communicated this opinion to Mr. Brown, he replied, "In your plant, the structure of the anther is indeed very remarkable, and might well induce you to consider it as forming a distinct genus; but it is right to add, that approaches to this structure, and which serve to explain its analogy with the ordinary structure of the family, exist in *Garcinia*, with which I suppose your plant would agree in its female flower, as well as in fruit."

As I have never seen the female flower, nor any drawing of it, I cannot add to the probability which is given to this conjecture by Mr. Brown having formed it, except by stating, that there are within the persistent calyces of the fruit, abortive filiform stamens, very much resembling those which are found similarly attached to the fruit of *Garcinia*.

The resemblance to the Ceylon plant, of the inflorescence and form of the flower-bud, of *Garcinia elliptica* (*Wallich's List, No.* 4869), led me to examine its structure in connexion with this subject, and I found it also to have male blossoms, with stamens precisely similar. Sir W. J. Hooker was also struck with the resemblance, and obligingly forwarded to me his specimen for examination. His flowers were further advanced than mine, and on my requesting him to steep one, he sent me drawings which it is impossible to distinguish from those taken from the Ceylon plant. It is unfortunate that we do not know the female flowers in either species; and yet, if I do not misunderstand Mrs. Walker, or if she is not mistaken, which is less likely, the Ceylon plant is monæcious.

It is very certain that the tree of Ceylon yields a *Gamboge*, fit for all the purposes of that from Siam, and equal to it in quality, though from the process by which it is prepared for the market not being so perfect, its appearance is less attractive, and the price must be depreciated till that process is improved. At present, however, we have no direct testimony as to the tree

which affords the *Gamboge* of Siam. Its being the same with that which in Ceylon yields this substance may be doubted. It is perhaps, and more probably, a nearly allied species of the same genus; this affinity appearing from the experiments of Dr. Christison, showing all but an identity of chemical composition in the product, and from their medicinal effects being precisely the same, as has been proved in Ceylon, and in this country, both by Dr. Christison and myself.

It seems probable, from some parts of the description in the *Flora Indica*, and the quality of the Gamboge yielded by it, that *Garcinia pictoria*, Roxb., may prove to be another species of this genus; but in this conjecture I must be wrong, if Buchanan is correct in considering this the same as *Oxycarpus Indica* (*Encycl. Method. Suppl.* 4. 257). I think, however, Buchanan is mistaken, for he deems it, at the same time, synonymous with *Garcinia Indica* of Choisy, and with "Arbor Indica Gummi guttam fundens," &c. of Burmann; while, in fact, the specimen in his Herbarium, from which he makes these references (No. 1118) is *Garcinia cornea*. The locality where *Garcinia pictoria* is found (Wynaad) being limited, and the tree having been, formerly at least, well known at Tellicherry, it is probable that specimens may be procured to ascertain the fact.

HEBRADENDRON.[1] *Graham.*

Nat. Ord. GUTTIFERÆ.—Class and Ord. MONŒCIA (or Diœcia?) MONADELPHIA.

GEN. CHAR. HEBRADENDRON. *Flores* diclines. *Masc. Calyx* membranaceus 4-sepalus, persistens. *Corolla* 4-petala. *Stamina* monadelpha, columella 4-gona, antheræ terminales, operculo umbilicato circumscisso. *Fæm.* incognitus. *Bacca* multi (4) locularis, loculis monospermis, staminibus quibusdam abortivis liberis basi circumdata, stigmate sessile lobato muricato coronata. *Cotyledones* crassæ, coadunatæ. *Radicula* centralis, filiformis.—Arbores *foliis integris.*

[1] From ἑβραιος δενδρον, in allusion to the peculiar dehiscence of the anthers.

1. Hebradendron *cambogioides;* floribus masculis axillaribus, fasciculatis; sepalis junioribus subæqualibus; foliis obovato-ellipticis, abrupte subacuminatis. (TAB. XXVII.)

Synonyms.

Carcapuli Linscot, *Herman. Mus. Zeylan. p.* 26. *Ibid. in Rheed. Hort. Malab.* 1. 42. *in nota.*—Ray, *Hist. Plant.* 2. 1661. *Samuel Dale Pharmacop.* 327.

Arbor Cambodiensis Guttam Gambi fundens. *Pluk. Alm.* 41. *Ibid. Mantissa* 20.

Arbor Indica Gummi guttam fundens, fructu dulci rotundo, Cerasi magnitudine, Carcapuli Acostæ. *J. Burmann. Thesaurus Zeylan.* 27.

Cambogia Gutta. *Linn. Fl. Zeylan.* 87. (*excl. omn. syn. præter. Dale, Ray, Burm. Herm.*) *N. L. Burmann. Fl. Indic.* 119. (*excl. Syn. Pluk. et Rheed*).

Mangostana Morella. *Gært. Fruct.* 2. *p.* 106. *t.* 105.

Garcinia Morella. *Desrousseaux in Lam. Encycl. Method.* 3. 701. *Pers. Synops.* 2. 3. *Choisy in De Cand. Prodr.* 1. 561.

Stalagmitis Cambogioides. *Moon's Cat. of Plants in Ceylon, Part I. p.* 73.

DESCR. A *Tree* of moderate size. *Leaves* opposite, petiolate, obovato-elliptical, abruptly subacuminate, coriaceous, smooth, shining, dark-green above, paler below, veins in the recent state inconspicuous, especially above; in the dried state, distinct on both sides. *Flowers* unisexual, monœcious (or diœcious?) *Male* small (eight to nine lines across), clustered in the axils of the *Petioles*, on short single-flowered peduncles. *Sepals* four, subequal, imbricated, concave, membranous, veined, the outer subentire, and somewhat coriaceous in the bud, the inner sparingly denticulato-ciliate, yellow on the inside, yellowish-white on the outside. *Petals* four, spathulato-elliptical, coriaceous, crenulate, longer than the calyx, yellowish-white, red on the inside near the base, deciduous. *Stamens* monadelphous; column four-sided; *Anthers* in a roundish capitulum, terminal upon a short clavate free portion of the *filament*, opening by the circumcision of a flat um-

bilicate lid; *pollen* yellow, granules elliptical. No trace of a *Germen*. *Female Flower* unknown. *Berry* about the size of a Cherry, round, with a firm reddish-brown external coat, and sweet pulp, four-locular, surrounded at the base by the persisting *calyx* and a few free abortive *stamens*, crowned with the four-lobed tubercled sessile *Stigma;* loculament single-seeded. *Seeds* large in relation to the berry, reniform-elliptical, compressed laterally, integuments yellowish-brown, easily separable into two layers; *Cotyledons* thick, cohering into an uniform cellular mass; *radicle* central, filiform, slightly curved.

Native of Ceylon.—For the colour and several other parts of the description, I am indebted to Mrs. Walker.

TAB. XXVII. A. Male flowering Branch. Fig. 1. Front view of a Flower. 2. Back view of ditto. 3. Side view of the Calyx and Column of Stamens. 4. Column of Stamens taken out from a Bud. 5. Anther:—all but 4 and 5 *nat. size*.—B. Fruit-bearing Branch. Fig. 1. Section of the Fruit with its four Seeds:—*nat. size*.

2. Hebradendron *ellipticum;* floribus masculis axillaribus, fasciculatis; sepalis exterioribus junioribus minoribus; foliis lanceolato-ellipticis, apice sensim attenuatis.

Synonym.

Garcinia elliptica. *Wall. List of Indian Plants, No.* 4869 (*not Choisy in De Cand. Prodr.* 1. 561).

I know nothing of this species, but from the specimens sent by Dr. Wallich to Sir W. J. Hooker's Herbarium and to my own. The specific character which I have drawn up, may therefore seem insufficient to distinguish it; and I might perhaps, have considered it only a *variety* of *H. Cambogioides*, but for the complete identity of form in the specimens from Dr. Wallich; their *prima-facie* difference from any of those received from Mrs. Walker; their considerably larger dissimilar leaves, and also their very different geographical position, less unlikely to possess natives of Siam than of Ceylon, Dr. Wallich's plants were obtained in Silhet.

V

NOTES UPON SOME GENERA AND SPECIES OF ORCHIDACEÆ IN THE COLLECTION FORMED BY MR. DRÉGE, AT THE CAPE OF GOOD HOPE.

By John Lindley, Ph. D., F.R.S., Professor of Botany in University College, London.

Mr. Drége's valuable collection of Cape *Orchidaceæ* having been placed in my hands by Professor Meyer, of Konigsburg, subsequently to the publication of the fourth part of the *Genera and Species of Orchideous Plants*, I am not likely to have an opportunity, for some time, of introducing into their proper places the new species of *Vandeæ* and *Habenaria*-like *Ophrydeæ* which it contains. I therefore propose to characterize them on the present occasion, and to avail myself of the opportunity for making a remark or two upon some geographical points connected with Cape *Orchidaceæ*.

One of the first things that strikes one in considering the relation between this portion of the Cape Flora and that of other parts of the world is, that by far the larger number of the genera belongs to *Ophrydeæ*. Until recent discoveries there were not more than six or seven species of other tribes known to exist there. This is the more remarkable, as these plants are extremely rare in corresponding latitudes in America and New Holland.

Secondly, the number of *Vandeæ* is far more considerable than had been supposed, or than would have been ánticipated in such latitudes. Mr. Drége's collection contains nineteen species, of which eight are epiphytes; and altogether we have about twenty-eight species of this division of the Order.

No one has yet discovered any species belonging to *Malaxideæ*, *Epidendreæ*, *Neottieæ*, or *Arethuseæ*, at the Cape, and yet the latter division forms the principal part of the Order in New Holland, and on the West coast of Chili.

It would seem that many of the Cape Orchidaceæ are exceedingly local, for every

separate collection of any extent, that I have seen, contains something peculiar to itself. *Holothrix parvifolia* seems to have been missed by all modern collectors, except Mr. Harvey; and *Satyrium tabulare, pedicellatum*, and *giganteum* of Linnæus, of which the first grows on Table Mountain, and the others near Zeeko River, near Algoa Bay, have never been gathered by either Burchell, Ecklon, Drége, Villet, or any of those by whose investigations the Cape Flora has of late years been so much extended. It is very much to be wished that these three plants should be sought out by some resident Botanist who has the leisure and means of looking after them. *Satyrium pedicellatum* exists in the Linnæan Herbarium, but I have never even seen the others.

Let me add, that the tract of jungle to the eastward of Cape Town, called Auteniqualand, or Outnequaland, is the country from which Mr. Drége procured a large part of the more remarkable plants in his collection, and that it is this district more particularly to which should be directed the attention of those who have the opportunity of occupying themselves with the inconceivably rich Flora of Southern Africa.

EPIPHORA. n. g.

Perianthium explanatum, labello postico. *Sepala* libera, lateralia æqualia. *Petala* forma diversa. *Labellum* carinatum, trilobum, cum columna sigmoideo-unguiculatum. *Columna* dorso prona, inversa, stigmate verticali, margine 3-tuberculato; basi paulo producta et cum labello articulata. *Anthera* 1-locularis. *Pollinia* 4, caudiculæ lineari affixa.—Herba *epiphyta*, Polystachyæ *facie, sub-bulbosa*. Racemi *terminales*.

1. Epiphora *pubescens*.

Super arbor. inter Kovi et Kaprivier.[1]

Epiphyta, palmaris. *Folia* bina, oblongo-linearia, plana, apice paulo obliqua. *Racemus* terminalis, foliis longior, 7—8-florus, cum ovariis pubescens. *Flores* verosimiliter lutei. *Sepala* lateralia lanceolata, acutissima, nullo modo obliqua; supremum oblongo-lineare, concavum, apiculatum. *Petala* paulo breviora, plana, obovata, obtusissima. *Labellum* paginâ superiore nudâ.

I hardly know where to station this very distinct genus. Its habit is that of *Polystachya*, but it belongs to *Vandeæ*. Perhaps it had best be placed near *Maxillaria*, on account of the protracted base of the column; but there is no obliquity whatever in the lateral sepals. To *Cymbidium* it likewise approaches; but its labellum, and very curious column, distinguish it from all the members of that heterogeneous genus. It was found by Mr. Burchell in the Caffre country, and is No. 3590 of his Herbarium.

EULOPHIA. *Gen. et Sp. Orch.* 180.

Section 1. GENUINÆ.

1. E. *ensata*. Lindl.

Prope Kovi.

2. E. *parvilabris;* foliis lanceolato-ensiformibus longitudine scapi, vaginis scapi laxis membranaceis striatis, racemo multifloro bracteis oblongo-lanceolatis striatis demum revolutis ovariis longioribus, sepalis lanceolatis acutis, petalis oblongis obtusis longioribus, labello sepalis duplo breviore complicato leviter trilobo ovato membranaceo lamellis 2 parvis pone basin, calcare obtuso ovario duplo breviore.

Inter Omsamwubo et Omsamcaba.

Verosimiliter tuberosa, ut E. *ensata*. Bipedalis, robusta; vaginis scapi internodiis paulo longioribus. *Folia* sesquipollicem lata. *Flores* speciosissimi, 14—15; sepalis verosimiliter herbaceis; petalis duplò latioribus et paulo longioribus. *Labellum* membranaceum, in unico flore quem vidi posticum, an semper, margine nullo modo crispo aut plicato; venæ omnes sunt immersæ nec ulla adest appendix paginæ, nisi lamellæ duæ parvæ breves truncatæ versus faucem calcaris.

A noble species, of which, however, I have seen only one expanded flower, the petals of which, in their dried state, are an inch and a half long.

[1] Also near Graham's Town. Burchell.

Section 2. DESCISCENTES.

In the *gen. et sp. Orch.* this section is characterized as having equitant leaves. I now find that although in some species the leaves are truly so, yet that in many others they are only folded together and carinate.

3. E. *tristis*, Spreng.

Zuurebergen; inter Bethelsdorp et Vanstaadesrivier.

4. E. *clavicornis;* foliis lineari-ensiformibus recurvis scapo paulo brevioribus, racemo 5—6-floro, sepalis oblongo-lanceolatis acutis, petalis oblongis mucronulatis duplò latioribus, labello obovato obtuso trilobo: lobis lateralibus truncatis planis intermedio crispo ramentaceo-cristato, calcare clavato ovario duplò breviore.

Katberg.

At one time I took this to be the *Satyrium hians* of Linnæus; but the specimen of that species in the Linnean Herbarium is either *Disa lacera* of Thunb. or some very nearly allied plant; so that the *Eulophia hians* of Sprengel has to be expunged from the system. I am, however, by no means certain that the *Limodorum hians* of Thunberg is not a synonym of this species.

5. E. *emarginata;* foliis lineari-ensiformibus scapo triplò brevioribus, racemo subsecundo multifloro, sepalis lanceolatis acuminatis, petalis paulò brevioribus obtusis, labelli trilobi lobis lateralibus ovatis intermedio obovato emarginato medio densè ramentaceo-barbato, calcare filiformi flexuoso ovario paulò breviore.

Inter Sohiloh et *Windvogelberg.*

Distinguished from E. *clavicornis* by its very different lip, more expanded and larger flowers, narrower petals, and longer spur.

6. E. *ovalis;* foliis lineari-ensiformibus scapo parum brevioribus, racemo multifloro, sepalis lanceolatis acutis, petalis paulo brevioribus obtusis, labello ovali plano leviter trilobo medio parcè barbato, calcare conico obtuso.

Ado, collibus graminosis.

Also allied to *E. clavicornis*, but with a very different lip, which is flatter, thinner, and less bearded than in any of the Cape species, except *E. cochleare* and *E. parvilabris*. A span high.

7. E. *micrantha*. Lindl.

Inter Kuga and *Zontagrivier, in planit. calcar.; inter Bethelsdorp et Vanstaadesrivier.*

The lip of this species has a deep membrane, something like the ligula of a grass, arising from the orifice of its short spur; it is probably analogous to the fleshy ridge found in a similar part in Zygopetalum.

8. E. *cochlearis;* foliis ensiformibus acuminatis recurvis numerosissimis, scapo ramoso terminali squamis longis acuminatis vaginato, perianthio carnoso connivente, sepalis ovatis acutis, petalis minoribus obtusioribus, labello cochleari indiviso crenato extùs sulcato intus subbarbato, calcare brevi retuso ventricoso.

Outniqualand, ad. marg. sylv.[1]

Very like *E. micrantha*, but larger, and with a totally different lip. These two species resemble *E. lurida* in inflorescence and general appearance.

9. E. *Dregeana;* foliis ensiformibus acuminatis recurvis longitudine scapi, vaginis scapi laxis foliosis imbricantibus, racemo multifloro denso, bracteis lineari-lanceolatis ovariis æqualibus, sepalis lanceolatis acuminatis subæqualibus, petalis oblongis tenuioribus acutis, labello oblongo trilobo lobis lateralibus rotundatis intermedio ovato plano venis disco cristato-lamellatis, calcare brevissimo ventricoso obtuso.

Prope Vischrivier, in graminosis; inter Keiskamma et Omsamcaba, vulgaris.

Rhizoma crassum, carnosum. *Scapus* pedalis. *Folia* parum breviora, versus basin unciam lata. *Vaginæ* circiter 5, laxè cucullatæ, acuminatæ, striatæ, verosimiliter foliaceæ, intenodiis multo longiores ideòque invicem imbricantes. *Racemus* palmaris. *Flores* magni, speciosi, sepalis pollicem longis, verosimiliter herbaceis; *petala* colorata.

This is by far the finest of all the Cape Eulophias, except *E. parvilabris;* it may follow *E. barbata.*—Allied to *E. Dregeana* are the two following species in Mr. Burchell's Herbarium.

10. E. *platypetala;* foliis linearibus ensiformibus recurvis scapo triplò breviori-

[1] Near Hartenbosch, by Mossel Bay. Burchell.

bus, racemo oblongo 7—8-floro, bracteis membranaceis acuminatis cucullatis pedicellorum longitudine, sepalis oblongis acutis, petalis ferè triplò latioribus æquilongis obtusis, labelli trilobi laciniis lateralibus ovatis planis intermediâ retusâ undulatâ ramentaceo-cristatâ, calcare cylindraceo obtuso ovario subæquali.

(Hb. Burchell, No. 6611.) *In agro Zwellendam, prope Zoetemelks Rivier.*

Vix pedalis. *Scapus* vaginis tribus distantibus acuminatis. *Folia* rigida.

11. E. *lissochiloides;* foliis lineari-lanceolatis suberectis scapo brevioribus, racemo laxo 8—9-floro, bracteis lanceolatis acuminatis patentibus, sepalis lineari-oblongis obtusis, petalis obtusissimis latioribus brevioribusque, labello trilobo laciniis lateralibus membranaceis ovatis intermediâ oblongâ subcuneatâ retusâ carnosâ, venis tribus lacero-cristatis, calcare conico incurvo.

(Hb. Burchell, No. 6764.) *Cum præcedente.*

Spithamæus. *Scapus* vaginis 2—3 distantibus. *Folia* palmaria, inter carinata et equitantia. *Flores* magis carnosi quam in speciebus huic proximis.

CYMBIDIUM. *Gen. and Sp. Orch.* 161.

Mr. Harvey has found at the Cape a plant that has escaped the notice of all other observers, and which he calls *C. plicatum.* I have seen no specimen; but the figure and accompanying description leave no doubt of its being distinct from *C. aculeatum.*

Cymbidium *plicatum*: Harv. MSS.;—scapo | erecto vaginato multifloro, spica ovata, bracteis ovario longioribus lineari-lanceolatis, sepalis erectis obtusis, labello trilobo, lobis lateralibus obtusis incurvis, medio truncato involuto ciliato, foliis radicalibus ensiformibus plicatis scapo longioribus.

Cymbidium plicatum. *Harv. in Hook. Ic. Plant. t.* 104.

Wet spots by the side of drains and in marshes on "the Flats" near Wynberg; rare.—Dec. 1835.

Root, one or more fleshy oblong or fusiform transversely fasciated tubers, with fleshy fibres from the crown. *Leaves* radical, about three, ensiform, strongly plicate, acute, the lowest short, the next longer than the scape, erect, they and the scape inclosed in a common radicular sheath. *Scape* straight, cylindrical, simple, sheathed, from the base to the apex, glabrous, bearing an ovate dense spike of white flowers; *sheaths* foliaceous, green, acute, striate, loose, erect; *bracteæ* linear-lanceolate, acute, longer than the ovarium. *Sepals* erect, never expanded; three *outer* ovato-oblong, obtuse, of equal length, the dorsal narrowest, the two lateral slightly keeled; *inner* obovato-elliptical, very obtuse, rather shorter. *Labellum* articulated with the prominent base of the column, erect, *not saccate* at the base, about as long as the sepals, trilobed, lateral lobes connivent, oblong, obtuse, medial rather the longest, truncate, its margins involute and waved, its surface adorned with about four rows of white ciliæ, which at its base are united into two prominent longitudinal ribs, reaching to the base of the labellum. *Column* short, about half as long as the labellum, prominent at the base; oblong, flat in front, rounded behind, with a triangular cavernous perforation near the apex, round the walls of which stigmatic tissue is developed. *Pollen-masses* geminate, solid, attached to a common scale at the apex of the perforation, concealed beneath a cucullate, deciduous hood. *Ovarium* clavate, spirally twisted, sessile, six-ribbed. *Capsule* pyriform. *Harvey.*

CYRTOPERA. *Gen. et Sp. Orch.* 189.

1. C. *foliosa;* vaginis scapi foliosis, foliis strictis ensiformibus, racemo multifloro vaginâ supremâ paulo longiore, (bracteis acuminatissimis laceris floribus longioribus,) perianthii carnosi laciniis lanceolatis acutis subæqualibus, labello concavo subrotundo trilobo lobo intermedio emarginato medio parcè papilloso basi tricristato.

Inter Basche et Omtala in graminosis.

Caulis sesquipedalis ferè ad racemum

usque vaginis foliosis instructus; lamina vaginarum ensata. *Folia* scapi longitudine, stricta, ensiformia, plana, striata, costis tribus conspicuis, in sicco 4 lineas (verosimiliter semunciam) latis. *Racemus* 2½ poll. *Bracteæ* fissæ et quasi ramentaceæ; an casu? *Flores* valde carnosi, subglobosi. *Sepala* lateralia basi producta, ob pedem columnæ qui brevior est quam in pluribus aliis speciebus. *Labellum* quodammodo obovatum, concavum, carnosissimum, tuberculis tribus oblongis contiguis ad basin cristatum; ultra tubercula pareè papillosum.

I have only seen a single specimen of this remarkable plant, which appears to have been only once found by Mr. Drége. It will stand next *C. plantaginea.*

It is very singular that *Cyrtopera pedicellata*, the *Satyrium Capense* of Linnæus, which Thunberg says grows near Zeekorivier and elsewhere, has not been found in any of the rich collections of Messrs. Ecklon, Drége, and Burchell, nor in the old Herbarium of Vahl and Horneman, nor in any of the numerous small collections I have examined. The specimen in the Linnean Herbarium, without leaves, shows that I was right in considering it a *Cyrtopera.* It is very distinct from any thing else, and is, perhaps, the smallest of the genus. It is most like a small state of *Eulophia tristis.*

LISSOCHILUS.[1] *Gen. et Sp. Orch.* 191.

1. L. *streptopetalus*, Lindl. Sepala et labellum paulò acutiora.

Vischrivier; Zwartkopsrivier.

2. L. *æqualis;* foliis ensiformibus acutis recurvis scapo multifloro brevioribus, sepalis petalisque subæqualibus ovato-oblongis obtusis, labelli lobis lateralibus rotundatis intermedio oblongo obtuso sulcato.

Zuurebergen in graminosis.

Scapus 1½ pedalis, foliis longior. *Bracteæ* acuminatæ, ovarii longitudine. *Racemus* sub-8-florus.

3. L. *platypetalus;* foliis ensiformibus canaliculatis recurvis scapo triplò brevioribus, vaginis scapi laxis cucullatis, scapo laxo multifloro, sepalis ovatis acutis reflexis petalis subrotundis apiculatis planis triplò brevioribus, labello carnoso hastato leviter saccato; lobis lateralibus parvis triangularibus intermedio oblongo tuberculis tribus crenatis seriebusque 5 papillarum in disco.

In collibus calcareis Kopje; Zuurebergen in saxosis.

Pedalis sesquipedalisque. *Scapus* laxè et distanter vaginatus. *Racemus* laxus, 10—12-florus. *Labellum* lineari-oblongum, margine membranaceum; cyatho parvo trituberculato circa faucem sacculi; *discus* apice tuberculis 3 oblongis carnosis crenatis inter quæ et saccum adsunt papillæ numerosæ sub-5-seriatæ demum in unicam connatæ quæ sacculum attingit.

I can find nothing in Mr. Drége's collections that will agree with the *Satyrium giganteum* of Linnæus, which is possibly an *Eulophia*, rather than a *Cyrtopera*, as I supposed in the *Gen. et Sp. Orch.* 190.

ANGRÆCUM. *Gen. et Sp. Orch.* 245.

1. A. *arcuatum;* caulescens, foliis distichis lineari-oblongis obtusissimis emarginatis, racemis multifloris foliis brevioribus, bracteis subrotundo-ovatis membranaceis concavis, sepalis petalisq. linearibus acuminatissimis patentissimis, labello conformi carinato revoluto, calcare arcuato tereti ovario duplò longiore.

Albany, paras. super arbores;[2] etiam *in coll. calcareo Kopje, paras. super radices fruticum* foliis multo brevioribus, magis carnosis, apice obliquè bilobis; an idem? flores desunt.

Folia ferè pollicem lata, apice æqualiter emarginata, in sicco striata, 6 poll. longa. *Racemus* ascendens 4 poll. longus. *Flores* carnosi. *Bracteæ* magnæ, conspicuæ. *Columna* nana, rostello elongato, apice antheræ supertecto. *Pollinia* 2, sphærica, caudiculis totidem linearibus cartilagineis glandulæ communi didymæ cartilagineæ adnatis.

The double caudicula of this plant is at variance with the true character of *Angræcum*, but I am too little acquainted with the Mauritius and Madagascar species to

[1] Mr. Burchell found *Lissochilus speciosus* near *Uitenhage;* it exists in his Herbarium (No. 4262), but I have never seen it in any other collection.

[2] Near Graham's Town. Burchell.

judge of its value. It is unaccompanied by any other peculiarity, and appears to agree with *Epidendrum polystachyum* of Thouars in that respect. The latter species is missed in the *Gen. and Sp. Orch.*, but should be placed next this as *Angræcum polystachyum.*

2. A. *bicaudatum ;* caulescens, foliis distichis lineari-oblongis obliquè bilobis, spicis horizontalibus multifloris foliis brevioribus, sepalis ovatis obtusiusculis, petalis angustioribus, labello tripartito plano, laciniis lateralibus intermediæ ovatæ æqualibus linearibus apice multifidis, calcare recto cylindraceo ovario triplò longiore.

In coll. calc. Kopje, prope Zwartkops-rivier.

Parva species, epiphyta. *Caulis* 3-pollicaris. *Flores* minuti ; bracteis brevissimis, membranaceis, obtusissimis, amplexicaulibus. *Labelli* laciniæ laterales caudam quandam apice pilosam simulant. Columna brevissima.

A very curious little species, with the habit of *A. palmiforme,* next which it might be arranged.

3. Angræci, sp. n.[1] adest in herbario (No. 8269), *in sylvis Outniqualand super arbores* a Dregeo lecta ; sed deflorata. *Caulis* est pedalis, foliis distichis recurvis apice inæqualiter bilobis, lobo altero falcato altero brevissimo.

4. A. *conchiferum ;* pygmæum, caulescens, foliis distichis linearibus inæqualiter bilobis vaginis verrucosis, pedunculis filiformibus unifloris, sepalis petalisque setaceo-acuminatis reflexis, labello semi-infundibulari repando crenulato membranaceo, calcare horizontali longissimo filiformi.

Outniqualand in sylvis.

Caulis pollicaris sesquipollicarisq. *Folia* coriacea, plana, pollicaria. *Bractea* ovata, cucullata, membranacea. Flos magnus in tam parvâ specie, calcare et labello simul sumptis 2 poll. longis.

A most curious little species, of which I have seen only a single flower, the pollen-masses of which had fallen away. The sepals and petals are quite membranous ; the labellum is of the same texture, and looks like one valve of a tiny delicate shell, with a long tube fastened gracefully to the hinge. If this is not the very model of a Triton's trumpet, I am sure it ought to have been.

5. A. *sacciferum ;* acaule, foliis lineari-lanceolatis distichis obtusis obliquè emarginatis, scapis subtrifloris foliorum longitudine, bracteis subrotundo-ovatis cucullatis, pedicellis filiformibus, sepalis oblongis acutis, petalis ovatis, labello cucullato ventricoso acuto, calcare brevissimo scrotiformi.

Outniqualand sup. arb.; etiam inter Key et Basche.[2]

Herba pusilla, facie *Trizeuxeos, Ornithocephali* similiumque. *Flores* minutissimi.

This and the next exhibit the genus *Angræcum* in a very pigmy state ; they belong to the set of *Angræcum caulescens.*

6. A. *pusillum ;* acaule, foliis linearibus falcatis striatis acutis apice obliquis, spicis erectis laxifloris foliis longioribus, bracteis brevibus diaphanis cucullatis, sepalis petalisque ovatis subæqualibus conniventibus, labello subrotundo-ovato acuto concavo postico, calcare recto ovario breviore.

Super arbores prope Boschrivier ; Outniqualand, prope Koratra.

Species delicatula, inter muscos vegetans, facie omnino *Phreatiæ elegantis* sed minor.

7. Angræci ? sp. duæ alt. adsunt, Dregeo *inter Key et Basche* lectæ ;—sed floribus delapsis non determinandæ (No. 8270).[3]

MYSTACIDIUM.

Perianthium patens, æquale, petaloide-

[1] Mr. Burchell also found this, but without flowers, near Krakakamma Lake, in the district of Uitenhage.

[2] Near the Nysna. Burchell.

[3] The West coast of Africa has lately afforded some remarkable species from the colony of Sierra Leone, of which *A. micranthum, Bot. Reg.* 1772, *A. distichum, ib.* 1781, and *A. caudatum, ib.* 1844, have already been published. I am, besides, acquainted with the following, all of which have flowered in the collection of Messrs. Loddiges of Hackney :—

A. *pertusum ;* caulescens, foliis distichis loratis obliquè bilobis, spicis recurvis secundis densifloris, sepalis ovatis obtusis patentissimis, petalis paulo minoribus, labello plano obovato reflexo apiculato infra medium calcarigero, calcare clavato labello longiore. *Folia* 4—5 poll. longa, suprà leviter scrobiculata infrà purpureo-punctata, valde carnosa, duas tertias pollinis lata. *Flores* parvi, purpurascentes, densè se-

um. *Labellum* calcaratum, cum columna articulatum, limbo indiviso. *Columna* brevis, recta, carnosa, semiteres, apice utrinque processu longo lineari instructa. *Rostellum* ovatum, elongatum, convexum, nudum. *Anthera* membranacea 2-locularis. *Pollinia* duo, dorso excavata caudiculâ longâ bicruri; cruribus filiformibus glandulis tot membranaceis peltatim insertis. Epiphyta, *habitu* Angræci.

1. M. *filicorne*. (*Limodorum longicornu, Swz. Angræcum capense. Gen. et Sp. Orch.* 248. *Epidendrum capense*, L.)

Vischrivier; super arbores prope Enon.

Planta epiphyta; tota palmaris, brevissimè caulescens. *Folia* disticha, obtusissima, semipoll. lata, obliquè emarginata. *Racemus* multiflorus, subsecundus, ab imâ basi floridus. *Sepala* et petala lineari-lanceolata, apice recurva. *Calcar* filiforme, apice infundibulare, sesquipoll. longum, arcuatum, dependens. *Limbus* labelli lineari-lanceolatus, carinatus, basi gibbosus. *Anthera* apice truncata, brevis, rostellum nullo modo tegens. *Appendices* columnæ lineares, canaliculatæ, diaphanæ, obtusæ, seriebus pluribus papillarum purpurearum transversis quasi barbatæ.

With the habit of an *Angræcum* this curious little plant has characters of so marked a kind as render it impossible to combine it with that genus. The curious two-legged caudicula, each point of which is inserted into the middle of a transparent gland, the naked rostellum, on which the legs of the caudicula are placed without any protection from the anther, and the two very curious bearded appendages that stand forward from the upper angles of the column, are all at variance with the structure of *Angræcum* and its allies. Upon comparing it with *Aeranthus, Œonia*, and *Cryptopus*, the differences of *Mystacidium* from those genera will be sufficiently obvious.

HOLOTHRIX. *Gen. et Sp. Orch.* 283.

The addition of several new species to this genus renders it necessary to alter and extend the characters of the two previously described.

1. H. *squamulosa*; strigosa, foliis orbiculatis squamulosis, spicâ densâ secundâ, labello cuneato 5-lobo calcare brevissimo conico inflexo.

Liefde, Koratra.

Palmaris ad spithamæam. *Folia* bina, 1—1½ poll. lata, orbiculata, horizontalia, carnosa, suprà squamulis acutis versus marginem densissimis vestita. *Scapus* evaginatus, robustus, strigis retrorsis hispidus. *Spica* secunda, densa, 2½—4 poll. longa. *Bracteæ* longitudine ovarii, acuminatæ, hirsutissimæ. *Ovarium* strigosum et sepala, quæ æqualia sunt, ovata, galeata. *Petala* linearia, hinc repanda, carnosa, crystallino-papillosa, labelli longitudine. *Labellum* concavum, oblongo-cuneatum, 5-lobum, crystallino-papillosum; laciniis linearibus obtusis. *Calcar* parvum conicum inflexum.

OBS. Ovarium in hâc et omnibus speciebus non omninò torquetur ut in pluribus aliis Orchidaceis, sed collum suum abruptè deflectit et simul torquet, unde flores horizontales fiunt ovario erecto.

2. H. *Harveiana*; foliis binis ovatis strigosis, scapo retrorsum piloso, spicâ secundâ multiflorâ, labello quinquelobo: laciniis lateralibus nanis acutis lateralibus subæqualibus acutulis intermediâ incurvâ, calcare horizontali abruptè subulato.—*Lindl. in Hook. Ic. Plant. v.* 2. *t.* 103. A.

Low sandy moist plains, called "the Flats," which extend almost from Table to False Bay, sometimes abundant. *Harvey.*

Tuber oblongum, indivisum, succulen-

cundi. *Racemus* 4—5 poll. longus. *Bracteæ* minimæ acutæ. *Labellum* fauce calcaris orbiculari infra medium perforatum, nec ad ipsam basin ut in reliquis.

A. *subulatum*; caulescens, gracile, foliis subulatis, sepalis ovatis acutis, petalis linearibus acutis paulò brevioribus, labello postico ovato cucullato crasso intus nudo, calcare recto filiformi ovario longiore. *Flores* parvi, albi, solitarii. *Columna* brevissima. *Pollen* Angræci veri.

A. *clandestinum*; caulescens, foliis crassissimis ensiformibus recurvis apice acutatis bilobis lobo altero longissimo, spicà horizontali densà semi-subterraneà, bracteis ovatis coriaceis rigidis, floribus nigro-pilosis explanatis, sepalis ovatis, petalis linearibus glabris, labello ovato cucullato nudo, calcare sigmoideo pendulo apice inflato. *Folia* plana, 6 poll. longa. *Spica* crassa, 1½ poll. longa. *Flores* parvi, albi. *Ovarium*, sepala a dorso, calcar. et labelli venter nigro-pilosa. *Labellum* margine viride et incrassatum. *Anthera* truncata, rostellum elongatum non tegeus; caudicula linearis simplex; glandula linearis, acuta, ascendens.

tum. *Folia* bina, radicalia, patentia, ovata, vel cordata, subacuta, carnosa; exterius maximum; setis flexuosis densissimè vestita. *Scapus* erectus, simplex, 6—10 uncias longus, spicam elongatam, secundam, florum viridium gerens, setosus; setæ deflexæ breves. *Bracteæ* ovatæ, acutæ, hirsutæ, ovarium semiæquantes. *Sepala* appressa, æqualia, oblongo-ovata, obtusa, pubescentia, viridia. *Petala* sepalis duplò longiora, linearia, obtusa; divergentia, erecta, vel apicem versus subporrecta, pallide virentia. *Labellum*, calcare conico-subulato, ovarium semiæquante, oblongum, concavum, quinquefidum; *laciniæ duo superiores* laterales breves, dentiformes, *duo intermediæ* subulatæ, obtusæ, patentes, *inferior* reliquis sublongior, inflexa, subacuta. *Columna* brevissima. *Anthera* cucullata, membranacea, bilocularis; loculis distantibus. *Pollinia* duo, clavata, didyma, e granulis magnis composita, pedicellis perbrevibus. *Stigma* minutum. *Ovarium* spiraliter tortum, tricostatum, hirsutum. *Harvey.*

3. H. *villosa;* mollitis et patentim hirsuta, foliis orbiculatis acutis, spicâ quaquaversâ, labello ovato trifido calcare recto sepalorum longitudine.

Paarlberg et alibi.

Folia bina, horizontalia, orbiculata, acuta, pilis longissimis intricatis vestita. *Scapus* 4 poll. altus, pilis longissimis, ferrugineis (in sicco), horizontalibus villosus, vaginatus. *Spica* quaquaversa 2 poll. longa. *Bracteæ* ovatæ, acuminatæ, ovarii longitudine, pilis raris rigidis basi bulbosis munitæ. *Flores* glabri, crystallino-papillosi, præsertim ad interius. *Sepala* ovata, acutiuscula. *Petala* linearia, basi latiora, labello æqualia. *Labellum* ovatum, concavum, semi-3-fidum, laciniis a latâ basi linearibus obtusis. *Calcar* rectum, obtusum, læve, sepalorum longitudine.

4. H. *parvifolia* (Gen. et Sp. Orch. 283); folio solitario ovato-subrotundo hispido, scapo strigoso, spicâ quaquaversâ, labello concavo trilobo: laciniis ovatis patentibus, calcare conico horizontali labelli longitudine.—*Hook. Ic. Plant. v.* 2. *t.* 103. *B.*

This is not in Mr. Drége's collection. Mr. Harvey finds it flowering in the beginning of November, in the driest and most barren hills and wastes in a stony or gravelly soil about Cape Town and Wynberg. The term lanuginose applied to the plant in the G. and S. Orch. was inadvertently employed for hirsute.

5. H. *gracilis;* pilosa, foliis geminis ovatis supra scrobiculatis, spicâ rarâ subsecundâ, labello trifido laciniis linearibus canaliculatis, calcare horizontali conico apice incurvo sepalis æquali.

Tafelberg.

Subpedalis, patentim pilosa. *Scapus* evaginatus. *Bracteæ* ovatæ, acuminatæ, ovario breviores, pilis longis rigidis munitæ. *Flores* glabri. *Sepala* lateralia hinc denticulata. *Petala* linearia canaliculata et labellum lævia.

6. H. *incurva;* pilosa, foliis spicâ secundâ, labello 5-fido laciniis linearibus æqualibus, calcare brevissimo inflato incurvo, sepalis apice pilosis.

Katberg.

Quatuor ad quinque poll. alta. *Scapus* evaginatus, pilis horizontalibus vestitus. *Spica* 1½ poll. longa. *Bracteæ* ovatæ, acuminatæ, ovarii longitudine, pilis longis ciliatæ. *Sepala* acuta, apice pilosa. *Petala* linearia et labellum in lacinias lineares semiquinquefidum lævia.

7. H. *exilis* (Gen. et Sp. Orch. 283); pilosiuscula, folio solitario ovato, spicâ subspirali pauciflorâ, labello trilobo: laciniis lateralibus nanis, calcare conico incurvo sepalis obtusis glabris breviore.

Not among Mr. Drége's plants.

SCOPULARIA. *Gen. et Sp. Orch.* 303.

1. S. *Burchelli, Lindl.;* bracteis sepalisque glabris, petalis labelloque setaceo-multifidis, spicâ subspirali.

Kopje, prope Zwartkopsrivier; Zuurebergen.

2. S. *secunda;* bracteis hirsutissimis, sepalis apice pilosis, petalis 3-fidis, labello multifido, spicâ densissimâ secundâ.

Witbergen, in summis montibus.

Scapus spithamæus, retrorsum villosissimus. *Folium* in meo exemplare unicum, planum, orbiculare, supra glabrum, margine ciliatum. *Flores* parvi, densi, secundi, facie Spiranthis cujusdam. *Bracteæ*

villosissimæ, leviter crenulatæ, ovatæ, acuminatæ, ovario paulò longiores. *Sepala* ovata, acuta, subæqualia, apice pilosa. *Petala* membranacea, lineari-cuneata, laciniis tribus æqualibus filiformibus, non setaceis, parte indivisâ paulò brevioribus. *Labellum* cucullatum, cuneatum, laciniis 9 proportione simili et magnitudine. *Calcar* a facie compressum et subsulcatum, obtusum, curvatum, labello duplò brevius.

This new and most distinct species of *Scopularia* has exactly the anther of that first described; it differs in the dense secund arrangement of its flowers, in its somewhat hispidly hairy bracts, and in the size, number, and proportion of the lacerations of the petals and labellum.

HABENARIA. *Gen. et Sp. Orch.* 306.

1. H. *cornuta;* caule basi folioso, foliis oblongis abruptè in vaginas imbricatas acutas mutatis, racemo densissimo multifloro, bracteis obovato-oblongis acutis ovario brevioribus, petalis bipartitis a galeâ carinatâ liberis: laciniis posterioribus setaceis anterioribus rigidis carnosis cornutis recurvis multò brevioribus, labelli tripartiti carnosi laciniis lateralibus convexis acuminatis falcatis intermediâ lineari-lanceolatâ deflexâ subæquali, calcare clavato apice inflato pendulo ovarii longitudine.

Prope Omsamculo.

Sesquipedalis. *Petala* cornuta semunciam longa. *Antheræ* steriles membranaceæ emarginatæ. *Processus* carnosi crassi clavati truncati. *Rostellum* parvum ovatum.

A most remarkable species, with the anterior segments of its petals long, fleshy, recurved, and looking very like the horns of some animal; and broader, not narrower, than the back segments. It must be placed next *H. vesiculosa.* I think we have here the most direct transition to *Bonatea,* but the upper lip of the stigma is so little developed that the species agrees essentially with the character of *Habenaria.*

2. H. *tridens;* foliis lineari-lanceolatis acuminatis basi subcordatis subitò in bracteas foliaceas acuminatas ovario longiores mutatis, petalis bipartitis: laciniâ anteriore setaceâ posteriori lanceolatæ æquali, labelli tripartiti laciniis rectis angustis acuminatis subæqualibus, calcare arcuato acuto ovarii longitudine.

Inter Omtala et Omsamwubo.

Vix pedalis. *Spica* laxa. *Flores* parvi. *Sepalum* dorsale concavum subrotundo-ovatum.—Next *H. lancifolia.*

BONATEA. *Gen. et Sp. Orch.* 327.

1. B. *speciosa,* W.

Inter Grœnevalei et Ruigtevalei.

2. B. *clavata;* caule folioso, foliis lanceolatis sensim in vaginas oblongas acutas cucullatas mutatis, racemo multifloro compacto, floribus longè pedicellatis, bracteis pedicellis longioribus convolutis acutis, floribus galeatis, petalis bipartitis: laciniis filiformibus recurvis posteriore duplò breviore, labello 3-partito laciniis setaceo-filiformibus petalis brevioribus, rostello ovato obtuso glabro antherâ breviore, canalibus stigmaticis longissimis acuminatis, processubus carnosis clavatis emarginatis galeæ longitudine, calcare pedicello breviore apice clavato obtusissimo.

Inter Gekam et Basche.

Bipedalis et ultra, facie *B. cirrhatæ,* inter quam et *speciosam* locum tenet quasi medium ab utrâque diversissima.

3. B. *tetrapetala;* caule folioso, foliis lanceolatis sensim in vaginas acuminatas mutatis, racemo longo laxo multifloro, floribus longè pedicellatis, bracteis acuminatis pedicellis longioribus, sepalis omnibus reflexis dorsali angustissimo, petalis 4: anticis ovatis convexis subunguiculatis carnosis posticis linearibus sepalo dorsali æqualibus, labello 3-partito laciniis lateralibus lineari-lanceolatis intermediâ lineari brevioribus, rostello subulato erecto antheræ longitudine, processubus carnosis clavatis petalis anticis brevioribus, calcare clavato pedicello longiore.

Inter Basche et Omtala.

Bi- tripedalis. *Flores* inter minores.

A very curious species, with its petals so completely separated, each into two, that the flower is really tetrapetalous.

TRYPHIA. *Gen. et Sp. Orch.* 333.

The parts of fructification in *T. secunda* are so exceedingly delicate and membranous, that in a dried state I find it quite im-

possible to satisfy myself of the description I have given of the anther in the *Genera and Species of Orchideous Plants*, being correct. In the collection of Mr. Drége is a second species, the parts of which are a little more fleshy, and easy to examine; of the anther of that a description follows:—

1. T. *secunda*, spicâ flexuosâ multiflorâ, sepalis labello medio pubescente triplò brevioribus.

Koratra.

Variat foliis ovatis et suborbiculatis.

2. T. *parviflora;* spicâ rectiusculâ pauciflorâ, sepalis labello glaberrimo paulò brevioribus.

Zwaanepœlspoort.

Folia 2, plana, ovato-subrotunda, acuta, glaberrima. *Scapus* 4 poll. altus, basi pilosus, vaginis nullis. *Spica* 5-flora. *Flores* quam in *T. secunda* triplò breviores. *Bracteæ* acuminatæ ovario æquales. *Sepala* minus acuta quam in *T. secunda*, galeata, labello haud multùm breviora. *Petala* linearia, obtusa, membranacea, ascendentim, basi labello adnata. *Labellum* petalis paulo brevius, omninò nudum; laciniâ intermediâ 3-partitâ lobis linearibus obtusis, lateralibus acutiusculis. *Anthera* loculis arcuatis, basibus angustatis, truncatis. *Glandulæ pollinicæ* minimæ, nudæ, inter plicas rostelli jacentes. *Rostellum* parvum, tenue, utrinque leviter plicatum ad glandulas recipiendum, medio in mucrone plano decurvo productum.

A curious little plant, about half the height, and with flowers hardly one quarter the size, of *T. secunda*. The way in which the petals adhere by their base to the face of the lower part of the lip is very curious, and would produce the appearance of a seven-lobed lip, if it were not that the petals stand erect in their usual position, and pull the lip up to them by means of the membrane that connects them.

BUCCULINA.

Flores ringentes. *Calyx* galeatus; sepalo supremo minore, lateralibus basi labelli obliquè adnatis. *Petala* carnosa, erecta, dentata, conniventia verosimiliter cohærentia, sepalis duplo majora. *Labellum* concavum, altè partitum, calcaratum. *Columna* marginibus productis faciei columnæ adnatis. *Anthera Platantheræ* (?) Herba, *acaulis; radicibus testiculatis, foliis orbiculatis horizontalibus, scapo evaginato glabriusculo.*

As a genus this differs from *Tryphia* in its petals not being united with the labellum; and from *Platanthera* in its column having the two sides brought forward and adherent to the face of the labellum; it also differs from both in its fleshy broad-toothed concave petals, which stand erect, and apparently adhere by their edges into a sort of vaulted pointed arch, giving the flower the appearance of having two little cheeks (*Bucculæ*).

1. Bucculina *aspera*.

Inter Mierenkasteel et Zwartdoornrivier.

Vix palmaris. *Radices* testiculatæ, tomentosæ. *Folia* bina, orbiculata, glabra. *Scapus* basi retrorsùm pilosus, sursùm glaber, evaginatus. *Spica* 4—5-flora, laxa, ut omnes partes floris levissimè pubescens. *Flores* expansi diametro semunciali. *Bracteæ* obovatæ, cuspidatæ, ovario duplò breviores. *Sepala* ovata, obtusa, subcarnosa; supremum duplò minus lateralibus. *Petala* subrotundo-ovata, acuta, magis carnosa, sepalis duplò majora, dente valido in margine anteriore, inconspicuo in posteriore; in fornicem acutatam cohærentia. *Labellum* cæteris partibus longius, concavum, papillis crystallinis exasperatum, medio barbatum, 5-partitum: laciniis linearibus, obtusis; calcare arcuato, compresso (?), labello duplò breviore et cum eo subparallelo. *Anthera* brevis; quantum videre licuit in flore unico quem examinavi fabricâ *Platantheræ;* marginibus columnæ productis, membranaceis, faciei labelli adnatis.

STENOGLOTTIS.

Sepala conniventia, libera, æqualia. *Petala* tenuiora, libera, concava. *Labellum* posticum, lobatum, liberum, ecalcaratum. *Anthera* erecta, loculis basi divergentibus; glandulis polliniorum nudis post rostellum absconditis. *Stigma* labio superiore (*rostello*) minimo tridentato utrinque leviter

saccato ad glandulas abscondendas, inferiore elongato linguæformi.—Herba *terrestris, radicibus fasciculatis, foliis rosulatis, scapo vaginato.*

This remarkable genus has the habit of a Neottieous plant, rather than of one of the present section. In character it approaches *Arnottia*, but differs, if that plant is correctly described, in its petals being distinct from the labellum, and in its stigma. I confess, however, I have some doubt whether there may not be some mistake about the characters of *Arnottia*, especially if *Amphorchis inermis* really belongs to that genus; and I regret exceedingly that I should never have been so fortunate as to meet with specimens of it; but still, supposing it to be incorrectly described, its solitary radical leaves render it probable that it will be found distinct from *Stenoglottis*.

1. S. *fimbriata*.

Inter Omsamwubo and *Omsamcabe*.

Folia rosulata, oblongo-lanceolata, obtusa, margine infra medium crispo, 2—2½ poll. longa. *Scapus* pedalis sesquipedalisque, squamis distantibus ovatis, acutis, vaginatus. *Spica* secunda, densa, multiflora, glabra. *Bracteæ* lanceolatæ, acuminatæ, ovario breviores. *Sepala* ovata, obtusiuscula, concava; supremum paulò angustius. *Petala* oblonga, concava, valdè membranacea, margine serrulata et quasi fimbriata. *Labellum* sepalis longius, posticum, lineare, canaliculatum, membranaceum, apice trifidum, laciniis lateralibus divergentibus intermediâ brevioribus; tuberculo parvo basi loco calcaris. *Flores* in exemplaribus meis marcidi vix veram perianthii indolem ostendunt.

BARTHOLINA. *Gen. et Sp. Orch.* 333.

The following two species are confounded up to the present time.

1. B. *Burmanniana* (*Ker in Brane's Journal, Orchis pectinata, Thunb.*); bracteâ ovario sepalisque extus hirsutissimis, labello sepalis triplo longiore.

Dutoits Kloof.

A dwarfer plant than the following. *Lip* more than an inch long.

2. B. *pectinata* (Lindl. in Bot. Reg. 20. 1653); bracteâ pubescente, ovario sepalisque pilosiusculis, labello sepalis duplo longiore.

Langekloof.

Lip in a dried state but little more than half an inch long.

A BRIEF BIOGRAPHICAL SKETCH OF THE LATE RICHARD CUNNINGHAM, COLONIAL BOTANIST IN NEW SOUTH WALES.

(With a Portrait.)

Scarcely had the public expression of regret subsided, occasioned by the untimely fate of two eminent botanical travellers, Mr. Douglas and Mr. Drummond, in whom the Editor of the present Journal had felt a deep interest, than a report reached this country of the death of Mr. Richard Cunningham, by the hands of savages, in the interior of New Holland. So vague, however, were the statements received in the first instance, that we hesitated to give them publicity: but at length they were confirmed by official communications from the Government of New South Wales: and it now becomes our painful duty to offer some account of another victim to the cause of Science. We are indebted for most of the particulars of his life and death to one who knew him intimately from his childhood, and whose affectionate kindness towards him was returned by the most devoted respect and attachment.

Richard Cunningham was born of humble, but respectable parents, at Wimbledon, in the county of Surrey, on the 12th of February, 1793. Whilst he was yet an infant, his mother died, and at the early age of six years, his father removed him from the preparatory school in his native village, to an Academy at Putney, conducted by the Rev. John Adams, A. M. Under the care and tuition of that eminent Scotch minister, he remained, with an elder brother, upwards of seven years, and the course of education pursued in that period, embraced the Greek and Latin Classics, Mathematics, the English language, general History, &c. At an early age, his bias of mind, though, as it were, but in embryo, was discernible by his preceptor.

Richd Cunningham

His chief studies were the grammatical construction of the English language and logic, while a love for argument and close reasoning were soon manifested by him. He was, in his boyish days, a warm admirer of the works of our standard English writers, and would peruse with the utmost attention, the productions of the Immortal Bard, of Milton, Addison, Pope, Goldsmith, and their contemporaries; to all which, his master, perceiving his assiduity, granted him free access in his own library.

It was a remark often made by his schoolfellows, and not unworthy of notice here, that whilst Richard's brother, who evinced far less application to study of any description, aspired, during his hours of recreation, to the society of the elder boys, who were far advanced in the Greek and Latin Classics, as well as the higher branches of Mathematics, and who walked and talked differently and separately from all others of the school, the subject of our memoir was uniformly to be observed in some snug corner of the ample play-ground, where he sought amusement, not in tops, marbles, kites, and such trifling matters, but in the far more rational exercise of playing *Village Schoolmaster*. There he might be seen, in the midst of a little circle, consisting of a few lads of his own age, or younger, and about of his own standing, whom he had, by his agreeable manner, persuaded to quit the gambols in which others so fully engaged between school-hours, and to join him and listen with attention to his little citations from Shakespeare or Goldsmith. At the close of each passage, which he usually delivered with force and pathos, he would call on one or other of his youthful auditors, to contribute something from their respective readings, on the merit of the recital of which, as regarded pause, inflection, emphasis, and action in delivery, he held the right of deciding. Often he would vary the scene, by converting the school-ground Course of didactic and pathetic citations into a debating Forum. He was then just advanced beyond his twelfth year, and his great delight was to invite little discussions on subjects within the grasp of his companions, whom he would adroitly lead into some fallacy, and then, in the warmth of their controversy, just before the school-bell again rang to recal them to study, he would step in, and in two words, point out the line of argument that should have been pursued in order to afford a satisfactory solution of the question.

Now, how readily do we discern in this little anecdote of Richard Cunningham's days at school, the dawning of that cast of mind in the mere boy, which so fully developed itself afterwards in the full-grown man! To the truth of this fact, many of our readers, who may have been intimately acquainted with Mr. Cunningham during the last twenty years of his residence in England, can bear full and ample testimony.

At the age of fifteen years, he entered the service of W. T. Aiton, Esq., at Kensington, who was then engaged in publishing a second edition of *Hortus Kewensis*. With that gentleman he continued as a clerk for nearly six years, until the whole of that long-looked-for work appeared, and an epitome of the same for the use of gardeners, in one small 8vo. volume, was published. He then removed to the Royal Botanic Garden at Kew, and there, as an amanuensis attached to that establishment, almost wholly immured from the world, and cut off from personal intimacy with men of science, although known by name to many British and Continental Botanists, eighteen of the best years of his life were suffered to roll by! During nearly the whole of this time, his elder brother was labouring in New South Wales and elsewhere in the southern hemisphere, to advance the Botanic, Geographic, and other Sciences. But that brother came home in the summer of 1831, and from that period the thread of the spell by which Mr. Richard Cunningham had so long been bound to the King's Garden, as a monk to his cloister or cell, may be said to have been broken.

One of the earliest, and, it may be added, one of the most earnest solicitudes of Mr. Allan Cunningham was to see his bro-

ther advanced to that situation of life where his great mental energies (which at Kew, from an absolute want of substantial intellectual occupation, sunk into a dormant condition) should find full employment; and where an ample scope would be afforded for their more perfect expansion. A situation, in fine, where his talents generally, and especially his knowledge of Botany, which had long lain dormant, could be employed to the benefit of mankind, to the advancement of Science, and to the building up of that honest fame and reputation to which his known character and abilities entitled him, and which all his real friends long wished to see conceded to him.

Such a walk in life, just fitted to his habits, and every way suitable to awaken his slumbering energies, was not long in being thrown open to his view. In May, 1832, the death of the late Mr. Charles Fraser, Colonial Botanist and Superintendent of the Botanic Garden at Sydney, was officially announced by the Governor of the Colony to the Secretary of State, and the appointment thus vacated was given to Mr. R. Cunningham, upon the strong recommendation of Mr. Brown, who represented him as an individual every way qualified for such a situation. In August of that year, he embarked[1] for New South Wales with that appointment, the Secretary of State having been pleased to make an in-

[1] The following extract from a letter written to the Editor of this Journal, while on the eve of quitting his native country, as it has proved, for ever, will show with what a cheerful state of mind he set out for his new appointment, and how anxious he was to render every service in his power to Botany, and to his friends in this country.

"Ship Mary, off Sheerness, August 25, 1832.

"Previous to sailing, I am anxious to address a few words to you, and to tell you, that among the commissions with which I am honoured, are several from Mr. R. Brown. I have particular instructions from him to look after *Dawsonia* in all its states; a leafless quadrangular-stemmed plant of *Rubiaceæ* (?) near Sydney; a submersed grassy aquatic plant in Sydney Cove, and *Sea-weeds* of all kinds; also *Sections* of remarkable *Woods*, the same of *Monocotyledonous Plants* generally, the *Trunk* of the Australian *Todea* (which he is disposed to consider specifically distinct from the African); stems of *Xanthorrhœas*, especially the dichotomous parts, West-coast Grasses (for I hope to work, occasionally, on the West and South-western colonies), a *Banksia*, supposed to differ from *B. Cunninghamii*, on Wilson's Promontory; and another at Port Phillip, his (Mr. B.'s) *variety β* of *B. integrifolia*, but believed to be also a species; also *Trunks* of the great *Nettle Tree*, &c. &c. Mr. Brown has also given me letters to your old friend, the Honourable Mr. M'Leay, Secretary to the Governor, with a parcel, containing Reviews and other periodical works, in English and French, which he kindly permits me to peruse during the voyage.

"We are now quite ready for starting, and having received this morning our sailing orders, many hours cannot elapse ere we must say farewell to Old England! My brother, ever affectionate and attentive, is here to the last, giving me the advantage of his valuable advice, in regard to my future conduct. A day or two ago, we were afraid of being detained in consequence of the sudden death of our Steward by cholera; but these fears, as well as others, arising from the over-crowded state of our little vessel, have, in a great measure, subsided, and we are now endeavouring to reconcile ourselves to our situation, every one setting the example to make the best of existing circumstances.

"We have some smart fellows on board among the convicts, whose communications, some of them really quite in official style, afford us daily amusement after dinner, it being required of the Surgeon, that he shall examine all their letters to their friends, to see that they contain nothing objectionable. I have, I am sorry to say it, an Aide-du-Camp in the shape of a botanical gardener. He actually pulled me up the other day, for not adopting the *modern* name given to the plant, long known in gardens under that of *Buonapartea juncea!* We have also a fine young fellow of a midshipman, whose fault has been that of borrowing a horse, and keeping it too long in company with his lady, probably with no intention of detaining it altogether. I hope to be able to obtain for him some indulgence, such as being dubbed constable, which will procure for him at least a little more *fresh air*.

"I will keep in mind your commission with respect to dried plants for your Herbarium, and should I meet with such collections as you mention, will make the best bargain I can for you, either by purchase or exchange, looking out particularly for voyagers, whether English or Foreign. By the earliest opportunity after my arrival at Sydney, I will report to you every particular that I have been enabled to obtain respecting poor Fraser, which may prove interesting to his sister or you, as you have kindly undertaken to point out a safe channel by which such articles of his property as I may collect, will reach her. I fear, however, there must be very little, as our Surgeon, Mr. Watt, with whom I consider myself fortunate in being placed in juxta-position, and who left the colony with General Darling, tells me the impression in Sydney was that, owing to his careless habits, Fraser died insolvent.

"You cannot confer upon me a more acceptable favour than by adding to my little stock of books such of your own works as you can most conveniently spare. The letters of introduction which you have kindly given me shall be turned to the best account I can, in favour of Science."

crease on the salary that Mr. Cunningham's predecessor had received. Together with other ornamental and useful plants, which he had obtained permission to carry out with him in cases on the ship's deck, were some open boxes of Vines of approved kinds, both for wine and raisins. These had been very judiciously selected for the purpose by James Busby, Esq., during a tour, which that liberal-minded gentleman had prosecuted through some of the best wine districts of France and Spain. After a voyage of nearly eighteen weeks, Mr. Cunningham landed safely at Sydney, with his collection of living plants for the use of the colony, in very excellent condition. In January 1833, he entered on the superintendence of the Botanic Garden in that colony with an earnestness and zeal which furnished good evidence of his having the improvement of the Establishment, in its several departments of Botany and Horticulture, perfectly at heart. An experimental ground was formed, in which the cultivation and propagation of vines and fruit-trees generally, were particularly attended to, and from which the colonists have since received ample supplies of cuttings. In the Botanical division, some improvements are made, and many of the rarer indigenous plants were brought in from remote localities, that had not previously found a place in the garden; while numerous valuable exotics, adapted to the soil and climate of the colony, were introduced. Thus, under the most favourable auspices, encouraged by the local government, in possession of a perfect knowledge of all that Botanists, prior to his day, had already effected in their investigations of the vegetable kingdom, in acquiring which he derived no ordinary advantage from the permission given him to inspect and arrange in England his brother's collections as they came home annually during fifteen consecutive years,—with, moreover, all the information at command, which it had cost that brother his long residence in the country to obtain—thus we say, provided, did Richard Cunningham enter upon the duties of Colonial Botanist in our Australian settlement.[1]

No Naturalist could have gone from the land of his fathers to a foreign clime, better mentally equipped for botanic investigations. Besides, his labours were to be exerted on a continent, hardly one-seventh of which has, even to this day, been looked at; such has been the apathetic coldness in matters of internal geographical investigation of the local governments; and such the incurious disposition of the colonists who now so firmly hold possession of the soil. That vast land

"lay all before him, where to choose"

his path, and every step he should take beyond the last foot-track of white man, would afford him new plants, new birds, new animals, and new beauties of wild and wood-land scenery on which the eye of a civilized being had never before been fixed!

Midst all these advantages, these noble prospects, in the best possible health and vigour, in an exceedingly salubrious climate, and beneath that deep, deep blue sky which none can forget, who has ever

[1] He speaks of his arrival, and of poor Fraser's death in the following extract of a letter, dated

"Sydney, Feb. 9, 1833.

"Our voyage, lasting one hundred and twenty-two days from the Lizard, was brought to a close on the 5th of January. Some parts were remarkably rapid, but calms under the Line, and adverse winds along the East coast of this continent, extended it to what it is considered an average passage. My reception here, especially from His Excellency and Mr. M'Leay, has been most gratifying: the former having promised to afford me every facility for prosecuting my researches.

"Among my first inquiries here, were those respecting poor Fraser's affairs, when I found that the fears I expressed in my last letter were too well founded; though such is the kindly feeling towards him, that many of his creditors assure me, that were he now alive, they would not press him for payment. The circumstances attending his decease were these:—He had gone with the carts to Bathurst for living plants. At Emu Plains, a distance of about twenty miles from Parramatta, on his return, he was taken ill; he reached the latter place in a very debilitated state from the hot winds, and died there in two days. Several of his friends went from Sydney to Parramatta to attend his funeral, of which, I believe, they defrayed the expenses. A few books which he left have been purchased by Mr. M'Lean, my assistant, for £15."

seen and enjoyed it, with, it may be said, a new world to work upon, Mr. Cunningham's career, alas! was destined to be but short! But the sad details of the arrest he met with, in the midst of his public labours, will be told in a few words presently.

In 1833, the Home Government, having determined to despatch a store ship to New South Wales with convicts, and with instructions to proceed afterwards to New Zealand, to cut spars of *Kauri Pine, (Dammara Australis,* Lamb.) for the Royal Navy, His Majesty's Ship Buffalo, having been put on commission, sailed from Portsmouth on that service. The master commanding this vessel received instructions from the Admiralty to take Mr. Cunningham on board at Sydney, in order that he might accompany the Expedition to New Zealand, with a view of affording his botanical aid in the selection of the particular spars adapted for main-top-masts for first-rates, which were then required for the public service. Of the particular tree, as it stood majestic in its native forests, not a soul on board had the least knowledge. The Buffalo reached Sydney at the latter end of the year, and having landed her convicts, was soon again ready for sea. At length the Colonial Botanist embarked, and was received with joy by the Commander and Officers, who were glad to have a scientific man with them on the speculative voyage on which they were to proceed. With what energy did our friend enter upon this new service! The repeated voyages of circumnavigation of the Australian continent, made, years before, by his brother with Captain King, recurred to his mind, and if there were wanting a further incentive to exertion, beyond the gratification of having so excellent an opportunity of exploring islands, the Botany of which was so little and so imperfectly known, that stimulus was supplied by the public letter sent from the Colonial Government by order from England, which stated that all the expenses he might incur, whilst engaged in that service, would be discharged out of the Colonial coffers.

As the Commander of His Majesty's ship had to confer with the Missionaries on the best mode of proceeding so as to obtain the prescribed kind of spars, those gentlemen, from their intimate acquaintance with the natives, and their knowledge of various remote inlets on the eastern coast, occasionally visited by them in prosecuting the designs of the Mission, being supposed to possess the best information on the subject, the Bay of Islands, on the shores of which are situated the Mission Stations, was the first port visited by the Expedition. The information obtained, however, proving by no means equal to what he had been led at Port Jackson to expect, the Commander made but a short stay at the Bay of Islands (the rendezvous of all whalers), where no trees of the *Kauri Pine* were now to be had. Weighing anchor, the Buffalo proceeded to Wangaroa, a port on the coast to the northward, where His Majesty's Ship Dromedary had, some years previously, cut a cargo of spars, of the dimensions now required. Mr. Cunningham, who had landed with the Officers at the Bay of Islands, it may be observed, had his first look at the indigenous vegetation, on its southern shore, and among the plants recognized several that he had already seen in the Herbarium, formed by his brother in 1826.

At Wangaroa, circumstances obliged Mr. Cunningham to quit the Store Ship altogether; and having furnished himself at Port Jackson with tents, he encamped, and lived entirely on shore; having, moreover, made a friendly acquaintance with the Chief, he hired natives to accompany him on his excursions, and purchased a canoe to enable him to examine with leisurely attention, the shores of the harbour, and perform excursions along the coast in fine weather. It may here be just observed, that some apparent difficulties presenting themselves to the commanding Officer of the Store Ship, in his outset to procure the trees from the ravines at Wangaroa, he recalled the felling gangs, and preparing for sea, stood out of the port, with the de-

sign of visiting the more remote parts of the coast to the South, hoping there to effect the ulterior objects of his voyage.

Here, then, terminated Mr. Cunningham's connexion with His Majesty's Ship Buffalo. Thus left alone, without a single European as friend or servant, on the shores of a harbour densely inhabited by savages, who had, but a few years before, massacred the crew of the Ship Boyd, and more recently had seized upon the houses and property of the[1] Wesleyan Missionaries, who, after much fatigue, privation, and insult had effected a settlement among them —thus left alone, Mr. Cunningham was immediately assured by the natives, that his life was perfectly safe with them, as they knew he was the brother of a man, who had, some seven years previously, lived and travelled with them in their native woods, and who, on taking his farewell leave, distributed among them many little tokens of his regard for them, as well as proofs of the high esteem in which he held men who, although savages, nay, even cannibals, possessed generous minds, and powerful intellectual faculties. The subject of our little memoir discovered at an early period, that his name, which the New Zealanders called *Canni-nama*, was a passport, a perfect safeguard to him wherever he rambled.

With confidence, therefore in, and aided by, these grateful people, Richard Cunningham commenced his botanical labours on the hills, around the Harbour and Valley of Wangaroa. In the woods he first beheld the only Palm yet known to exist in New Zealand, *Areca sapida* (*Soland.*), and there he gathered specimens of a new genus of *Santalaceæ*, which he named from the natives, *Mida*, as also samples of several plants of *Cunoniaceæ*, of the Linnæan genus *Weinmannia*, and others closely allied to it. In these dark recesses, was discovered a slender tree, of remarkable habit, having a flower that shows its close affinity with *Brexia*, a genus of M. Aubert du Petit Thouars, from which, however, it is essentially distinct in the structure of the ovarium, which has, in each cell, two collateral ovules. *Quintinia*, a genus of M. Alph. De Candolle, closely related to *Escallonia*, and the only published species, a native of New South Wales, has another species in these rich woods, where also some *Pittospora*, quite unknown to Botanists, further rewarded the researches of our enterprizing traveller. Deep in the glens or ravines, where great shade and perpetual moisture reign, he beheld with delight the richness of the *Filices* of these regions, of which he gathered many a specimen. In those secluded dells, which are never warmed by a genial solar ray, he found several beautiful *Epilobia*, and in the rocky beds of small brooks, and growing below the surface of those rapid gurgling streams, was observed that charming little plant of *Orchideæ*, an *Acianthus*, first seen by his brother in 1826, bearing its remarkable flowers. The skirts of these woods were overhung with those species of *Clematis*, which had been detected by Sir Joseph Banks, in the first voyage of Cook, blended with two kinds of *Rubus*, remarkable for the elongated clusters in which

[1] In February 1827, these excellent and highly exemplary persons were obliged by the natives to retire precipitately from the beautiful valley in which they had, with great patience and perseverance, established themselves. The savages forcibly took possession of their houses and property, and having ransacked the former, burnt them to the ground! As these patient Missionaries, one of them a married man, with an amiable wife, in delicate health, and three small children, were pursuing with hurried step their retreat from the sad scene southerly towards a Church Missionary station, twenty miles distant, where they met with every succour that humanity could suggest, they reached the verge of the Great Forest at the head of the Vale. There, as if actuated by one common emotion, they all turned to take a last farewell look at the spot whereon their hopes had been built. But it was a heart-rending sight on which they had paused to gaze, for they beheld the revels and the dances of the savages, excited by wild exultation, amidst the devastation they had scattered around. Their comfortable and commodious well-constructed habitations, which had cost them many a long day's toil to rear, and of which but an hour or two previously, they had held quiet possession, they now beheld a mass of burning timbers. From this scene, too grievous to be long gazed upon, they turned, and with uplifted hands and hearts, hastily plunging into the dark shades of the primæval forest, which shut out further view of the vale, they pursued their onward path to the Bay of Islands, in silence and in tears!

their fruits are disposed. On the shores of the harbour, almost within the range of flood-tide, it afforded our Botanist (in his canoe-excursions with his Indian boys) great gratification to cull from the trunks of *Metrosideros tomentosa* (A. Rich.), called *Pohutukana* by the natives, an orchideous *Epiphyte*, richly in flower, which M. Achille Richard has confounded with *Dendrobium biflorum* of Swartz, a plant exclusively indigenous to the Society Isles. Professor Lindley has, however, shown it to be very distinct, and has named it *Dendrobium Cunninghamii* (*Bot. Reg.* under fol. 1756).

Quitting the harbour of Wangaroa, Mr. Cunningham now travelled from its entrance southerly, along a line of sandy shore, not previously examined by Botanists. In this excursion, accompanied as he was by his friendly natives, he added many plants to his collections, of genera usually seen on the sea-coast, or in woods in its vicinity, his labours on this occasion being especially rewarded by the discovery of an entirely new *Fuchsia*, which he found stretching its procumbent branches, upon the sands of the beach, immediately beyond the range of the tide, in the neighbourhood of the Indian village, Matauri. Reaching the Bay of Islands, he examined its shores, and explored the rivers falling into it, to their sources, by means of his canoe; and, although the season was exceedingly dry and unfavourable to the growth of many herbaceous plants, his collections were progressively augmented as he advanced. If the vegetation clothing the banks of one of the rivers (the Keri Keri) furnished, by its diversified forms, an ample scope for the exertion of his zeal and industry, not less did the scenery on either bank, and the character of that stream, call forth his admiration. It is, to use the words of an eminent Missionary, "a fine brawling torrent, in places very beautiful and romantic from its situation—here cutting its way through an extensive plain, there, rushing through deep and umbrageous valleys; now passing on with a silent sluggish motion, and anon hurrying down deep declivities, or among crags and stones, or flinging its limpid waters over precipices ninety or one hundred feet in height, and dashing itself into foam on the rocks beneath." (See Yate's Account of New Zealand, p. 8). In the woods, almost immediately below the larger of these[1] cataracts, by the spray from which they are ever kept in a very humid state, that rare and most remarkable of all the *Filices* hitherto discovered in New Zealand, alone exists, which by reason of its pedicelled thecæ being exserted upon a Receptacle, beyond an urceolate Involucrum, thus presenting the form of a spike or raceme, each capsule, moreover, being furnished with an oblique annulus, constitutes the new and very distinct genus, allied to *Davallia*, proposed by Mr. Brown to be named *Loxoma*. Of this we have beautiful figures engraved from the pencil of F. Bauer, Esq. for an early number of this Journal.

The exploration of the rivers and country adjacent to the Bay of Islands having occupied a period during the drier months of the year, Mr. Cunningham quitted that eastern side of New Zealand for a season, and proceeded to examine the country interjacent to it and the mouth of the Hokianga River, on the opposite coast, where the breadth of the island from sea to sea is estimated at sixty statute miles. In his route, in part through densely wooded tracts, he added daily to his collection of specimens, gathering also such few seeds as were presented to him. On the 24th of January, 1834, having descended the Hokianga River to the sea, our traveller examined its very remarkable heads of entrance, where, among other fine plants, he discovered a new and beautiful *Veronica*,

[1] This splendid fall of the waters of the Keri Keri, which, says the Rev. W. Yate, in the interesting work above cited, "is poetically denominated by the natives, the *Waiani-waniwa*, or "Waters of the Rainbow," is situated about two miles from the Mission Station on the right bank of that stream. There the river rolls majestically over a rock, whose perpendicular height is about ninety feet, and is received in a circular pool or basin, the margin of which is composed of loose stones, covered with Mosses and with such Phænogamous plants as love a perpetually misty atmosphere."

bearing flower and fruit in great abundance. This he named at the time *V. speciosa*, and it has since been described under that trivial appellation in the Botanical Magazine, under folio 3461.

Enraptured by the novelty and exuberant growth of the vegetation, and assisted by the missionaries and by those natives, whom the benevolence of those worthy men had attached to them, Mr. Cunningham explored, with his wonted zeal and energy, the forests in the environs of the river, in the more swampy woods on which stream, he observed with astonishment the *Kahikatea* or *Swamp Pine* (*Dacrydium excelsum*, Don) laden with the climbing *Freycinetia*, whose rooting rope-like stem, with here and there a tuft of leaves, wound itself spirally to the summits of those straight and lofty trees. After devoting nearly a whole month to the neighbourhood of the river, he proceeded thence, back to the Bay of Islands, by a new route, extending many miles through a heavily timbered wood, called "the Great Forest," through which the natives had cut a direct line of path, to facilitate the communication with the Missionary Stations on the other coast. In this primæval wood, he viewed with admiration many fair and noble specimens of the undisputed monarch of the forest, the *Kauri* (*Dammara Australis*, Lamb.), with their vast heads towering above the other gigantic timbers of those deeply-shaded recesses, supporting on their upper branches large tufts of those Tillandsia-like Epiphytes, the species of[1] *Astelia*, originally discovered by Sir Joseph Banks. These also Mr. Cunningham gathered; with specimens in flower and fruit, of those large trees of *Laurinæ*, the *Tarairi* and *Tawa* of the New Zealander. These produce large, plum-like fruits, which being greedily devoured by the *Kukupa*, or large Wood-Pigeon of those islands (*Columba Novæ Zelandiæ*, Latham), the Indian who may be pursuing his way silently through those umbrageous woods, and may be provided with a musket, invariably halts a short while beneath the trees in their fruit season, for the chance of a shot at that most beautiful but most stupid of all birds of the wood, the flesh of which he values highly, not so much on account of its flavour or quality, delicious though it really is, as the quantity each bird affords.

In making a hasty sketch of the vegetable riches of these regions, it must here suffice to notice some of the more remarkable, whilst plodding onwards with our traveller through the recesses of the Great Forest. With this view simply, the following may be mentioned.

The genus *Laurelia*, Juss. (*Pavonia*, Ruiz), the solitary species of which, hitherto known, is the Sassafras of the Chilian woods, has a second now added to it, from the forests of New Zealand, where it forms a tree of agreeable aspect, and in stature above thirty feet. Another tree, elegant in habit, and called by the natives *Maka-Maka*, belongs evidently to *Cunoniaceæ*, and is closely allied to *Weinmannia;* but it constitutes a distinct genus, the flowers being decandrous, the seeds smooth, and the number of the floral envelopes quinary. *Veronica salicifolia* (Forst.), a slender tree, often exceeding fifteen feet in height, is in all seasons to be found daily in flower. *Melicytus macrophyllus* (MSS.), a second species of the genus, was found, its type being among the original discoveries of Sir Joseph Banks: also *Metrosideros taxifolia* (MSS.), the *Aki* of the New Zealander, which, by means of its rooting stem and branches, ascends the highest trees, producing terminal clusters of white flowers; together with *Metrosideros robusta* (MSS.), or the *Rata* of the natives, a noble tree of great dimensions, often attaining an altitude of eighty feet. The Indians

[1] These plants are much valued by the natives for the sweetness of the stem upon which the flowers grow. "They will climb," says Mr. Yate, "the highest tree in search of these Epiphytes, and when they have gathered them, will sit for a long time at the bottom of the tree, sucking out the juice of the stem, which to them, especially on a hot day, is peculiarly grateful. These plants," adds Mr. Yate, "give the smaller groves the appearance of an English rookery; and there only wants the *Tui* (*Merops circinnatus*, Lath.) that polyglot bird of the woods of New Zealand, to imitate the cawing of the Rook, to make the deception complete."

themselves survey with admiration the copious blossoms of this stupendous tree because of their brilliant puniceous blood-red colour; and, long since, the prying European visitor has regarded the timber as admirably adapted for ship-building, it being close-grained and of great durability.

Nor were the verges of these forests wanting in evidences of the beauty of Flora's productions; for among others loving light and an occasional sun-beam, more than the inhabitants of the forest's recess, may just be noticed the highly ornamental *Drimys axillaris*, or Winter-Bark of these islands, the *Corynocarpus* of Forster, a handsome tree, with large glossy laurel-like foliage, the nuts of which the provident Zealander is said to collect and store up against a year of scarcity; the *Elæocarpus Hinau* (*Dicera dentata*, Forst.), a timber-tree, growing to the height of sixty or seventy feet, and almost at every period of the year to be observed bearing its copious racemes of pure white flowers; the stately *Dracophyllum latifolium* (MSS.), a plant of *Epacrideæ*, frequently twenty feet high, in habit very like a *Dracæna;* the *Hartighsea spectabilis, Adr. Juss.* (*Trichilia spectabilis*, Forst.), the pendent racemes of whose flowers are borne on the older branches, and often on the trunk; and the *Phyllocladus trichomanoides* (Br.) a *Pine* of graceful regular growth, furnishing an exceedingly valuable timber, which is much sought after for the decks of ships.

Early in March, 1834, Mr. Cunningham returned to the Missionary Stations at the Bay of Islands, abundantly gratified with his tour to the western coast, and laden with an abundant harvest from his labours. Another and a more favourable season had now set in; he therefore, with renewed energy, examined a second time the shores of the Bay, and the wooded banks of the several rivers it receives. In these final excursions he materially enriched his collections, gathering more perfect specimens of many plants, than a previous season had afforded him. With the view of establishing them in the Botanic Garden at Sydney, he also applied himself to selecting certain living plants of the forest, both of the primitive timber and others, either remarkable for the richness of their foliage, or beauty of their flowers. Robust seedlings of these were chosen, and carefully planted in boxes.

But the period arrived for Mr. Cunningham's departure for Port Jackson, and His Majesty's Ship Alligator, having put into the Bay on a temporary visit, an opportunity was afforded him to return to the Colony, with the various collections he had formed. He therefore embarked with Captain Lambert, about the close of April, and after a passing call at Norfolk Island, he landed at Sydney on the 13th of May.

The duties of the garden and some minor excursions in the colony occupied his attention during the remainder of the year.

At length, early in 1835, an explorative expedition,[1] equipped on a grand scale, to

[1] A brief notice of a little journey into the Interior, and of the projected, but ill-fated expedition, is thus expressed in a letter addressed to the Editor, dated

"Botanic Garden, Sydney,
Jan. 25, 1835.

"I take advantage of the departure of the first Wool Ship this season, to send you a package, containing a selection from our late collections in the vicinity of the Nepean River, on the Blue Mountains, at Tomah, &c. I do not expect there will be found many species among them new to your Herbarium, which must, I think, be inferior only to two in the United Kingdom. Some of the specimens I send may, however, be in different states of inflorescence from what you already possess. You have, I believe, an original set of Sieber's Plants from this colony; if on a comparison with them, it be found that I have mistaken any of his (I allude particularly to the *Leguminosæ*), I shall be thankful to be set right.

"My late excursion to Tomah proved a very agreeable one, and altogether tolerably successful. Tomah is the mountain where *Fieldia* (*Fieldia Australis*, see Hook. Ex. Flora, t. 232) was first met with by my brother, as you may remember. I send seeds of it to Mr. Murray, and hope he may get them to vegetate; they cannot well be more fresh. You will find among the plants in the bundle, *Pimelea hypericina* (*Bot. Mag.* t. 3330), respecting which my brother wrote to me in July last. There is hardly, I think, a doubt that my Tomah plant is identical with that of King George's Sound, though the morsel my brother sent me was so destroyed by damp as to leave me somewhat to hesitate between it and another species that has fallen in my way. I was pleased also to meet at Tomah with a plant which you probably have in your Herbarium, under the name *Loranthus*; but it is *terrestrial*, and although I unfortunately neglected to put specimens of

ascertain the course of the Darling River of Captain Sturt, and to prosecute further extensive geographical researches in the remote Interior, was reported ready to proceed from Sydney, and the direction of the party being confided to Major Mitchell, the able Surveyor-General of the Territory, Mr. Cunningham was invited by that officer to accompany the Expedition in the quality of Botanist. The permission of the local Goverment having been obtained, he made arrangements for the management of the Botanic Garden during his absence, and most gladly joined Major Mitchell to investigate the Botany of internal regions, wholly unknown to us.

In the beginning of April he left Sydney on that important service, and having passed the Blue Mountain Range to the western country, joined the party (of twenty-two persons) previously despatched, at Boree, a station on the North-West of the settlement of Bathurst. Being fully acquainted with the discoveries already made by his brother whilst on expeditions of a similar nature, since the earliest under the direction of the indefatigable Oxley, in 1817, he was well prepared to pronounce on any actual discovery of his own, in the country, beyond the last step of previous enterprizing explorers, and therefore his attachment to this considerable party was connected with many a pleasurable anticipation.

With such eminent qualifications to prosecute botanical investigation in the new country before him, with great zeal and patience to pursue it, and moreover, with a physical strength of constitution that rendered him fully able to combat the severest fatigues and privations to which all persons traversing an arid previously untrodden country are more or less subjected, our traveller appeared, however, to want one requisite, very essential to explorers who have to thread trackless wooded countries, oftentimes as in the case of New Holland, striking only for their gloomy mountainous aspect. This was the faculty by which a recognition of spots, previously seen, is effected with facility. The individual thus gifted with what our French neighbours call "le compas dans la tête," is by it enabled to penetrate with the utmost confidence a level closely-timbered district, in configuration of surface, alike for one or for fifty miles, and with perfect precision to trace his footsteps back to the point he had originally left. To employ the language of the Phrenologist, the organ of *locality* was exceeding small, if at all developed, in the subject of our Memoir.

its flower and fruit into spirits, as I should have done, still I trust those I send will suffice to determine the question, whether or not it should form, with *L. floribundus* of Labillardière, the genus *Nuytsia* of Mr. Brown. We brought home a growing specimen with us, which appears likely to succeed in the Botanic Garden.

"Dr. Lindley has written to Dr. Bowman, who is the Principal of the Medical Department here, for a full-length specimen of *Xanthorrhœa hastilis*, which reminds me to observe that I have hitherto refrained from sending you any bulky specimens, as *Xanthorrhœas*, sections of the stems of *Proteaceæ*, *Epacrideæ*, &c., fearing to incur an expense on such articles as I have often known to prove enormous. Last year, however, I met with the Commander of a vessel, who was willing, for the consideration of a few seeds, to take home, free of charge, a *Xanthorrhœa* which I had obtained for Mr. R. Brown, and I understand this very *Xanthorrhœa* is now put up, in a glass case, at the British Museum. Should such another opportunity occur, I will avail myself of it to transmit you such articles as I should think would be acceptable.

"According to present arrangements, I am to start on the 2nd of March, with Major Mitchell, Surveyor-General of this Great South Land, on the grand journey, of which so much has been talked ever since my arrival in this colony. I cannot, however, state particularly what our route will be; but Major Mitchell is most anxious to make a push for the Swan River Settlement. This, *if it can be effected*, with the spur which the expected arrival of our new southern neighbours will give to geographical discovery, bids fair to throw open a considerable portion of the unknown Interior of this vast territory during the current year. Should motives of economy, however, actuate the Governor to postpone the Major's journey, or prevent my being a party with him, I will, in such case, follow up my intention with regard to the sister colony of Van Diemen's Land. I have written to Hobart Town by desire of His Excellency, to inquire what botanical purchases can be made there, but I think, without vanity, I may be able to prove that far better collections would be obtained by travelling in the train of an exploring expedition, than by sending a commission to obtain them by purchase. You will be glad to hear that a *Castanospermum australe* (All. Cunningham, in Bot. Misc. v. 1. p. 241. t. 51 and 52), and *Grevillea robusta* (Bot. Mag. t. 3184), have flowered in the Botanic Garden here for the first time."

It had been often remarked by his friends in New South Wales, who had accompanied him on short excursions for the pleasure of his instructive conversation, that he seldom quitted a beaten track to penetrate a mile into the wild bush without becoming embarrassed in his attempts to regain the path he had left. This repeatedly occurred in the earlier stages of the expedition to which he was attached. Daily, when the party were on the march, the Botanist would deviate to the right or left of the line of route, and oftentimes would wander so far from the people in his zeal to collect plants, that it was with great difficulty he found out the evening encampments of his companions, whose anxiety for his safety was thus oftentimes greatly excited.

Vainly did the Director of the Expedition expostulate with our poor friend on the risk he was running in thus quitting the party so incautiously in a wild flat country. It was to no purpose that Major Mitchell repeatedly urged his friend to keep close company with the others, expressing his opinion in forcible language, that "unless he took more care, he would never return to Sydney!" All was ineffectual—an inexplicable fatality attended all his movements when alone, which was of daily occurrence when on horseback, so that it became a remark that he was not so often with his companions as away from them.

But we must hasten towards the close of our Memoir, for sad are the events with which it must conclude!

After a march of nine days from the station at Boree, whence the expedition commenced its progress, Major Mitchell reached the country through which "New Year's Creek" of Sturt (the Bogan of the aborigines) meandered, to its junction with the Darling. As he found no water for either his party or the cattle, in any part of the desert waste, within an ordinary range round the spot on which he was necessitated to bivouack on the evening of the 16th of April, the Surveyor-General put his people in motion at an early hour of the following morning, and pursued a course, generally to the North-West, himself leading the way, some distance before the party with the drays. Mr. Cunningham had, it seems, lingered behind the people; on coming up, however, with them, and learning that the principal of the Expedition had gone on to mark the line of route, he again left them, riding on before, and observing as he parted company, that he would join the Major. But it was otherwise ordained—his companions saw him no more!

Major Mitchell, after proceeding a few miles to the North-West, earnestly trusting to find water for his famishing cattle, most unexpectedly intersected a dry creek, dipping to the North. Changing his course towards that cardinal point, in hopes of meeting with water lower down, the Major carefully marked his route along the bank of this creek, which marks Mr. Cunningham, when he came to its dry channel, did *not* observe, but crossing it, continued onward, over the dead level to the North-West, in hopes of soon overtaking the conductor of the expedition. By pursuing this westerly route for five or six miles, he effectually lost all knowledge of his position relatively with that of his companions, when darkness closed the day, leaving him, his horse, and dog, to spend the night on a trackless, waterless, waste.

Meanwhile, his anxious companions, having gained the left bank of the Bogan and obtained water, their cattle rested twelve days, while they prosecuted a diligent search for their lost companion. They soon intersected his track, which they followed with earnest expectation through a very deviating course, to all points of the compass, on an area of level, very thinly-wooded country, of about twenty miles in length by four in breadth. In pursuing their painful search, they observed on the second day of his absence, the obvious proofs of the exhaustion of the poor horse, in Mr. Cunningham's steps being alongside those of the animal which he was then leading. Two days afterwards, the horse having apparently strayed from his master.

and being unable to sustain life longer, having passed five days without water, its emaciated carcase was found stretched out on a small plain.

But Mr. Cunningham had crossed the Bogan River about five miles, as it was afterwards ascertained, lower down that stream than the spot where the tents of the party then stood, and pursuing his route with extraordinary vigour along its banks downwards, he utterly defeated all further attempts to recover him, for twenty miles farther on he fell into the hands of the natives, who gave him food, and invited him to bivouac with them at night.

During this last distressing night of his life, it seems he repeatedly rose, doubtless under the influence of much mental and bodily anguish, increased by having been so long a time without food. He walked about, and acted so incoherently, as to excite the suspicions of the natives, who were otherwise, it would appear, favourably disposed towards him.

Daylight came, probably the dawn of the morning of the 24th or 25th of April, 1835, when the Indians, in doubt whence the stranger came, or of the causes that urged his singular conduct, determined to destroy him, and that desperate act was speedily effected by four of these savages rushing upon him with their clubs and spears.

These melancholy particulars of the last moments of our excellent friend, are furnished to us by Lieutenant Zouch, (4th Regt.) the officer of the mounted police at Bathurst, who had been sent with a party in October last to ascertain Mr. Cunningham's fate. The sad details were gathered from three of the natives, who had perpetrated the horrid deed, by one of whom that officer was conducted to the spot where it took place, and where the remains of the amiable subject of this memoir were found, and, with a truly Christian feeling, decently interred. A mound of earth was raised over the grave, and the large trees around it barked; these being the only means the officer and party had of marking the spot, whereon a civil servant of the government, entirely devoted to science, had (in his zealous perseverance to follow up his beloved pursuit) incautiously strayed from his companions, and meeting with the savage aborigines, had fallen a sacrifice to the suspicions his distressing appearance and conduct had excited in them. He had just attained his 42nd year.

Such was the lamentable termination of the life of Richard Cunningham, an exceedingly energetic and talented Botanist, and a no less generous and benevolent man. His mild, humane, and engaging disposition, had endeared him, during the short time he had been in the colony, to many friends, who were induced for some time fondly to cherish the opinion, after he was officially reported at Sydney to have been lost, that he was still alive; and that even savages of the most ferocious character could not be induced to offer violence to a man, whose whole conduct and pursuits were eminently amiable and peaceful.

It is gratifying to know that his talented brother, Mr. Allan Cunningham, has accepted the appointment, thus vacant by the death of Richard, of Colonial Botanist at Sydney, for which place he sailed in October last. Previous to embarkation he arranged his brother's notes on the Botany of New Zealand, combining with them the result of his own researches, and those of others in that group of islands; thus forming a valuable "*Floræ Insularum Novæ Zelandiæ Precursor*," which will soon appear in the pages of the present work. Should his life be spared we cannot doubt but that vast acquisitions will be made to our knowledge of Australian Botany, and we trust he will live for many years, to follow up the investigation on which his lamented brother had so successfully entered, and on a field where his own exertions had previously been rewarded by most abundant harvests.

BOTANICAL INFORMATION.

UNIO ITINERARIA.

We are anxious to lay before our readers the following brief particulars respecting the collections of the Unio Itineraria, which have just been communicated to us by our valued friend John Hunneman, Esq., who has kindly undertaken to act as Agent for that useful Society in this country. Excellent as have been the plants of the former journeys of the collectors for this Institution, those that have recently been distributed from *Arabia Felix* have far exceeded them in point of interest and value: and when it is seen that arrivals are expected from *Abyssinia,* we are sure that the Botanists generally, throughout Europe, will be anxious to possess themselves of them.

Dr. Steudel thus writes to Mr. Hunneman.

"Further supplies of Arabian plants have arrived, for which a similar subscription of £3 is to be paid; and as the collection is already in our possession, the Subscribers are not liable to any disappointment. A further subscription will be received for Abyssinian plants, the amount of which is to be £6.

"Subscriptions will also be received for New Holland specimens, of which there will be about thirty shares of two hundred species each, at the rate of £2 per hundred. But although these are in excellent condition, it is but fair to state, that they will not be so interesting to those individuals who possess Sieber's collections from that country, since there is only about a third part different from those of Sieber.

"Collections of specimens from Chili, some of two hundred and some of one hundred species, at £1 10s. per hundred, are also offered."

FLORÆ INSULARUM NOVÆ ZELANDIÆ PRECURSOR; OR A SPECIMEN OF THE BOTANY OF THE ISLANDS OF NEW ZEALAND:

Comprising, in a synoptical form, those plants that were discovered by Sir Joseph Banks and Dr. Solander, during the first voyage of Capt. Cook, that have been, for the most part, already published:—as also those that were collected in the subsequent voyage of our great Circumnavigator, which were described by Dr. Sparmann, and afterwards published in the work, known as Forster's Prodromus;—to which are added some new plants, gathered by Allan Cunningham whilst on a visit to the Bay of Islands and circumjacent country in 1826*; the few that were found by the French Naturalists attached to the voyages of La Coquille and L'Astrolabe, as indicated by the recent Essay of M. Achille Richard;—and, finally, those interesting discoveries which Richard Cunningham made duing his excursions on the northern Island, in portions of the years* 1833 *and* 1834.

(The whole arranged and edited by his Brother, Allan Cunningham, Esq.)

GEOGRAPHICAL INTRODUCTION.

Those isolated strips of land of the Southern Pacific Ocean, originally designated by the discoverer of their northern parts (in honour of the States General) Staaten Land, but long known since by the name of New Zealand, consist of three larger islands, which, viewed with the many contiguous islets that are scattered in the offing, especially along their eastern coast, may, with propriety, be regarded as an archipelago. They were first discovered in the year 1642, by the celebrated Dutch navigator, Abel Jansz Tasman, who had been dispatched by the Governor and Council at Batavia, to prosecute discoveries in the then "almost unentered regions of the Southern Pacific." As the enterprising spirit of that able seamen met as

early reward, in the discovery of our present southern colony, Van Dieman's Land, he was encouraged to proceed thence to the eastward, and on the 13th of December of the above year, descried land in lat. 42° South, and in about 170° East long. from Greenwich, as deduced from Tasman's statement, who reckoned from the Pic of Teneriffe. This land was the northwestern shore of the larger, or *middle* island of New Zealand, along which he steered to the northward, so close to the land as to be able to see distinctly the break of the surf on the beach. No signs, however, either of smoke, houses, or inhabitants, were to be perceived, as the vessels (named the *Heemskirk*, a yacht, and the *Zeehaan*[1], a fly-boat) plied along shore.

At length, after doubling Cape Farewell of Cook, and perceiving the land to bend easterly, he entered the Strait, now bearing the name of our great circumnavigator, and came to anchor in a spacious bay, which he afterwards named Moordenaar's or Murderers' Bay, from the unfortunate circumstance of his quarter-master and a boat's crew having been massacred by the savage inhabitants. Previous to this sad affair, the natives had put off from the shore daily in their canoes, and had even approached within a stone's cast of Tasman's vessels; they nevertheless could not be tempted to come on board by the exhibition of linen or knives; and as our navigator did not consider it prudent to effect a landing, he entertained no hope of obtaining refreshment for his crew from such savages. He therefore weighed and stood to the northward, giving twenty-two canoes, of which several were full of people, who had attempted to pursue his vessels, a discharge from his guns at parting. Running along the western shore of the northern island, he did not attempt, after the loss he had sustained, to land on any part of the coast; but on passing Cape Maria Van Dieman, he anchored on the 6th of January, 1643, on the North side of the islands, in the offing, which, in allusion to the day, (the Festival of the Epiphany,) he named *Drie Koning*, or the Islands of the Three Kings.[2]

Now this was all the Dutch navigator, Jansz Tasman, saw of New Zealand, of the discovery of which, however, modern geographers have most justly given him the credit.

At the period of this discovery of Tasman, and for upwards of a century afterwards, these islands were considered as a part of a vast *Terra Australis Incognita*, and the hypothesis of the existence of a great southern continent was fondly entertained by geographers, until the results of the first voyage of our own great circumnavigator entirely subverted such a theory.

On the 5th August, 1769, in prosecuting the first voyage of circumnavigation, Captain Cook made the East coast of the northern island, and two days aftewards anchored his ship in Poverty Bay, in lat. 38° 42′ South. In the afternoon of Sunday, October 8, the first landing ever effected by Europeans there took place; and on its shores, it is worthy of remark, those eminent Naturalists, Sir Joseph Banks and Dr. Solander, who had accompanied Cook in that memorable voyage, gathered the first specimens of native plants, and thus formed the nucleus of those valuable and extensive collections of the vegetable products of these islands, which were got together by their united skill and industry, in the many subsequent landings that were afforded them by their commanding officer, at various points, during the six months he devoted to the survey of the coasts of those highly interesting islands, of which not only the limits were wholly unknown prior to that period, but, saving the portion on the western

[1] Literally, the *Hen of the Sea.*

[2] Epiphany Day, the 6th of January, is that on which the Infant Saviour was visited by the three Magi, or Wise Men from the East, as related to us by St. Matthew. In Catholic countries, these three personages have generally been called the Three Kings of Cologne, in conformity with a legend which may be found in divers authors. Their bodies are said to have been brought from the East to Constantinople; thence they were transferred to Milan, and, finally, they found their way to Cologne, where, report says, they are still preserved.

Libr. of Ent. Knowl.—See New Zealand.

side imperfectly glanced at by Tasman, more than a century previously, as we have just shown, it may be added, wholly unseen by European eyes.

In the brief notice here proposed to be taken of the progress of geographical inquiry, with which the investigation of Natural History appears to have gone hand-in-hand, on the coasts of New Zealand, as well in Cook's, as during the subsequent visits of navigators to those islands, whilst on voyages of discovery, it may not be altogether uninteresting to the botanical reader, who occasionally looks at a map, and is desirous of observing what opportunities the accompanying Naturalists had afforded them to land and enrich themselves with the vegetable and other products of those islands, to join us, in first following Captain Cook in his original great voyage along those coasts; then noticing briefly the visits and results, as regards Botany, of subsequent voyagers on discovery, in the order (chronologically speaking) in which they were severally prosecuted.

After a stay of three days in Poverty Bay (during which brief period he discovered its inhabitants were as fierce and savage as Tasman had found them on his transitory visit in 1642, on the opposite coast) Cook quitted the port, to which he gave a name descriptive of its inhospitable character, having no fresh water on its shores. During the following week, he stood along-shore to the southward, but finding the land to continue in that direction, apparently without termination, he put about to explore the coast to the North. Passing the port he had left some days previously, he anchored his vessel in a bay called by the natives Tegadoo, and there the Naturalists added materially to their collections during the Commander's short stay, for the bay had nothing to recommend it, being very open, without fresh water, and affording no shelter from the prevalent winds. A landing was also effected at Tolaga, immediately to the South of it (now better known as Howa-howa Bay) where several days were occupied in examining the shores and in filling their casks, good water being found convenient to the beach. From the natives, however, Cook remarks, we got nothing by barter but some fish and a few sweet Potatoes (*Convolvulus Batatas*). Dogs and Rats were seen with the natives for the first time. The adjacent forests, however, yielded many valuable timber-trees, of which upwards of twenty kinds were cut down; and specimens, both of their wood and branches, with flowers and fruit, upon being examined on board, proved, like several of the birds that were shot in those primæval woods, quite new, and of which, as Cook emphatically observes, "*none* of us had the least knowledge."

Among the stately trees, that immediately on landing, arrested the attention of our indefatigable Naturalists, was the noble *Knightia excelsa*, Br. There also, it may be remarked *en passant*, was first observed and cut down for the sake of the top, the Palm called *Areca sapida* by Dr. Solander.

Weighing, after completing the vessel's wood and water, Captain Cook now plied to the North, and on doubling what is now called Cape East, he crossed the Bay of Plenty and entered a port, called Opuragi by the inhabitants, but which he subsequently named Mercury Bay, from the circumstance of his having observed, on its shore, the transit of the planet Mercury over the Sun's disk. Twelve days were variously and profitably occupied in the neighbouring country, in which many of the more beautiful plants of the voyage were gathered, and, notwithstanding the hostility manifested by the natives towards their visitors, much information was collected, regarding the capabilities of the soil on that part of the coast. It may here be observed, that on the sandy shores of this bay Dr. Solander discovered his *Clianthus puniceus*, now an acclimatized inhabitant of our gardens.

The voyage was resumed to the North, and as the *Endeavour* ran along shore, natives were every where distinguished from the deck, on the beach. Four days subsequent to the departure of our voyagers from Mercury Bay, they reached the æstuary of a large piece of water, tending

to the South-West. This Cook entered, and occupied nearly a week in exploring; and as it proved upon examination, to be a river of expanded mouth, and of considerable length to its upper branches, it reminded him of one of the more useful streams in his native land, at the antipodes of which he and his companions in peril now were. He named it the Thames. On its banks the first specimen of *Dammara Australis* (Lamb.), or *Kauri Pine*, the Monarch of the Forests, was observed, and a tree of it, of great bulk, cut down. Having surveyed the river and islands in the offing, Captain Cook pursued his voyage northerly, but meeting with contrary winds, he stood into the Bay of Islands, now so well known as the original spot whereon missionary exertions were commenced in favour of the native inhabitants —now, where the principal missionary stations have long been established, and also, the principal rendezvous of the fleets of whalers that annually visit the South Seas. There the Naturalists found an ample field for botanical investigation, as well on its shores as on the banks of the rivers discharged into it. Among the plants collected, were some new species of *Pittosporum;* the shrub constituting a genus closely allied to *Logania* of Mr. Brown, and now referred to *Geniostoma* of Forster; and several *Coniferæ* of the genera *Dacrydium*, *Podocarpus*, and Mr. Brown's genus *Phyllocladus*. Numerous also were the *Filices* with which they augmented and enriched their collections; and of these, that rare and beautiful Fern, an inhabitant of the inundated woods of the Kaua-Kaua river. *Todea pellucida* (Hook. Ic. Plant. t. 8.) deserves special mention.

Quitting that spacious bay, after devoting a week to its investigation, our navigator pursued his survey of the coast to the North, and on the 1st of January, 1770, doubled the northern extremity of the island, observing, as he passed, the islets called "The Three Kings," under which the intrepid Tasmann had, upwards of a century before, found shelter for his little vessels. As soon as favourable winds permitted, Capt. Cook stood to the South, along the line of western coast, but no opportunity was presented to the Botanists to land on any part of it. At length he reached the western entrance of the Strait, now bearing his name, by passing through which to the sea on the East, he satisfactorily determined the insularity of the land to the North, upon the survey of the coasts of which one hundred days had been occupied. Finding shelter and good anchorage in an indentation of the northern coast, of what is now entitled the Larger or Middle Island, the Naturalists were again enabled to add considerably to their collections of plants. The shores of this inlet, named by Cook, Queen Charlotte's Sound, were found densely clothed with wood, almost to the water's edge, and in some places scarcely to be penetrated.

The vegetation, however, wore a less vivid, luxuriant aspect, abundantly indicative of a cooler latitude and less hospitable climate, than that through which they had just passed so agreeably. However, the mountains, which rose from the immediate shore and bounded the view on the South, exhibited flanks bare and rugged; whilst on their summits snow reposed, although it was in the height of the summer season.

The extent of the Middle Island was yet to be ascertained. From the hills in the vicinity of the anchorage, it appeared to form part of a great country, stretching far to the South, having a connected chain of lofty, barren, snow-capped mountains, extending in the same direction. Having procured wood and water, our persevering Navigator proceeded to its examination, by steering to the South along its eastern coast, but he soon had to contend with tempestuous weather, as he increased his latitude. At length he doubled the southern extremity of the land in the parallel of 47½°, not observing, however, as has been since ascertained, that it formed an island, nearly fifty miles square, being separated from the larger by a channel, now known as Foveaux's Strait.

By passing round this southern island (named on the maps, Stewart's Island),

and gaining the western coast of the large one, our great Circumnavigator determined accurately the geographical character, figure, and extent of New Zealand, and at once dispelled the favourite dream of the older Geographers, of its forming a portion of a vast continent, which they fondly imagined stretched far into the antarctic regions towards the South Pole!

As he now urged his voyage northerly, along the western coast of the larger island, he barely looked at an apparently well-sheltered harbour at its South-western extreme; which, by reason of the seemingly perpetual mist that hung over its shores, he named Dusky Bay. The examination of its shores, as well as its vegetation so rich and diversified as has been since shown us by our very excellent and venerable friend, Mr. Menzies, was, however, reserved for another voyage, and for other Botanists.

After running up that line of coast, to the North, and reaching the Strait already navigated, Captain Cook, before he took his final leave of those islands, anchored in Admiralty Bay to fill his water-casks, and thus the Naturalists had one other opportunity given them to step on shore and observe, as their Commander has it, "if any gleanings of natural knowledge yet remained." Here terminated, for that voyage, the exploration of those highly interesting islands by our able Circumnavigator, in the prosecution of which he had consumed upwards of twenty-six weeks; and during that period had afforded such facilities to the illustrious men, whom the pure love of Natural Science had induced to accompany him to land and pursue their researches, that it may be truly said, by far the greater number of the phænogamous plants of those islands at present known, were discovered and collected in that memorable voyage!

On Saturday, the 31st of March, 1770, Cook and his companions bade adieu to the shores of New Zealand, and taking their departure from Cape Farewell, they stood to sea at West, other and greater discoveries awaiting to immortalize them, and among these that of the entire coast of New South Wales, a line of shore lying in the direction of the meridian, nearly two thousand miles in extent, and wholly unseen by previous Navigators.

But we must hasten on to take a more cursory notice of the subsequent visits[1] to those islands.

As an evidence of the interest that had been already excited by the accounts of Cook and De Surville of New Zealand, before the return of the former to those islands, whilst prosecuting his second voyage round the globe, they were visited by another French Navigator, named M. Marion du Fresne, who had sailed from the Mauritius in the Ship Mascarin, accompanied by another vessel, on an explorative voyage to the eastward in the Pacific Ocean, "in quest of its hidden islands and continents." He made the West coast, nearly Cape Egmont (of Cook) on the 24th of March, 1772, and eventually directed his course northerly round to the Bay of Islands, where he had communication with the natives, who, on being shown iron tools, such as axes, hatchets, and scissors, evinced the strongest anxiety to get possession of them, and instantly handled each of them in such a way as to convince their French

[1] In noticing these visits chronologically, it is proper here to remark, that Cook's ship was not the only European vessel which the year 1769 brought to New Zealand's shores; for it appears from a work, published by the Abbé Rochon, at Paris, in 1783, that on the 12th of December of that year, whilst our great Navigator was plying to the North of Doubtful Bay (in lat. 35°), on the eastern side of the northern island, a French vessel, the *St. Jean Baptiste*, under the command of M. de Surville, also first came in sight of the very same part of New Zealand; contrary winds, however, for some days prevented him from making the land; but at last, by perseverance, for he was an intrepid and plodding navigator, he succeeded in effecting an entrance into an inlet to which he gave the name of Lauriston Bay (in honour of the then Governor-General of Pondichéry), the same that Cook had called Doubtful Bay.

After a short stay at anchor, in which period he was hospitably received by the natives, he resumed his voyage towards the Island of Juan Fernandez and the coast of Peru. There is no record of Surville's having seen Captain Cook, nor of his having interested himself in the Zoology or Botany of the shores on which he landed daily during the fortnight he remained in the bay.

visitors that they perfectly understood their use. This was a lesson of civilization for which they were doubtless indebted to the previous visit of Cook, for in no part of the northern island does it appear that M. Marion found the people to have any acquaintance whatever with iron. The utmost cordiality and harmony existed between the natives and their visitors for a space bordering on five weeks, and it has never been explained on what ground the former, in a moment when the French were least prepared to make resistance, exhibited the most transcendent perfidy conceivable, by murdering M. Marion himself, four of his officers, and a boat's crew of twelve persons, who had just landed from their ship! It does not appear that M. Crozet, the first Lieutenant, whom Cook afterwards met at the Cape of Good Hope, and describes as "a man possessed of the true spirit of discovery," who published the voyage of M. Marion, that during his stay at the Bay of Islands, Natural History, in any one department, was in the least attended to. No collection of plants was made.

In 1772, Captain Cook was again despatched by government, to prosecute further discoveries in the southern hemisphere. The *Resolution* and *Adventure* were equipped for this important service, and Reinwold and George Forster (father and son) were attached to the expedition in the capacity of Naturalists. Upon reaching the Cape of Good Hope, Cook was induced, by the entreaties of the Forsters, to allow the celebrated Naturalist, Sparmann, then at Cape Town, to join the expedition. It is possible that to this circumstance may attributed, not only the determination of the species of plants gathered in that voyage, but the publication of the Work entitled *Florulæ Insularum Australium Prodromus*, in 1786; in the title-page of which, however, the name of that learned Swede does not appear! The elder Forster, in speaking of Dr. Sparmann's labours in the voyage, elsewhere says, "Sparmannus plantas describebat, filius, easdem delineabat; ego vero totum me zoologicis descriptionibus dicabam. Verum dum Sparmannus plantas accuratius examinaret, filius et ego sæpe in consilium vocati in commune consulebamus." *Char. Gen. Pl. præf. p. iii.*

In prosecuting the second Voyage of Circumnavigation, to the eastward, Captain Cook made the shores of New Zealand at Dusky Bay, within which he moored the *Resolution* on the 25th of March, 1773, and there remained nearly seven weeks. The country at the back of this bay is described as exceedingly mountainous, the hills forming part of that great chain which extends throughout the larger island from Cook's Strait. These hills are said to wear an aspect, than which a more rude and craggy feature can rarely be seen; for the mountain-summits are of stupendous height and consist of rock, totally barren and naked, except where they are covered with snow. Skirting the sea-shore, the land and all the islands in the bay are densely clothed with wood, nearly down to the very water's edge. The trees, Cook tells us, are of various kinds, such as are common to other parts of New Zealand, those of *Coniferæ* and *Myrtaceæ* being fit for the ship-wright, the house-carpenter, and cabinet-maker.

"Except," continues our Navigator, "in the River Thames, I have not seen finer timber in all New Zealand: the most considerable for size is the Spruce-Tree (*Dacrydium cupressinum*, Soland.), many individuals of which were observed from six to eight and ten feet in girth, and sixty and eighty, to even one hundred feet high, quite large enough to make a main-mast for a fifty-four-gun ship."

Of the leaves of this tree Cook made beer, which he gave to his ship's company; and when well prepared, and corrected from its extreme astringency, by a decoction of *Philadelphus*,[1] or *Tea-plant*, prov-

[1] Anderson, the Surgeon and investigator of Natural History during the third voyage of Cook, says, "we drank" (an infusion of, he means) the leaves of the *Philadelphus* (*Leptospermum scoparium*) as Tea, and found it had a pleasant taste and smell, and might make an excellent substitute for the Oriental sort." Cook's third Voyage, I. p. 148.

ed a good antiscorbutic, and was acknowledged to be little inferior to the American Spruce Beer, by those who had experience of both.

Perfectly unimpaired in physical strength by the fatigues and privations of his former voyage round the globe, which had employed him three years to effect, and of that period, a part in unknown icy seas, the first labours of Cook's second voyage were commenced on these shores, with an energy of mind quite worthy of himself. The survey of the bay proceeded; in the prosecution of which by boats, and often accompanied by his Botanists, he was repeatedly absent at night from the ship, although in a chilling, tempestuous, damp climate, having, as he emphatically says, "the stony beach for a bed, and the canopy of heaven for a covering." Such is the extreme humidity of the atmosphere, that the woods were perfectly dripping with moisture, thus furnishing those favourable conditions of wet and shade in which cryptogamic vegetables more particularly delight to live. Hence, both of *Ferns* and *Mosses* numerous species were found. Of the former, an arborescent species of *Dicksonia* was met with in the woods and ravines, that had not been previously seen in New Zealand; and there the Orchideous Epiphyte, so frequent at the Bay of Islands and elsewhere, *Epidendrum autumnale* of Forster (*Earina*, Lindl.) was also detected. It is doubtless very probable, that the shores of Dusky Bay, which are in 45½° South, are about the highest latitude at which Tree-ferns and Orchideous Epiphytes exist in the southern hemisphere.

During Captain Cook's stay at this South western part of the island, a party of his officers, with the Naturalists, attempted to penetrate inland among the mountains, by ascending the hills at Cascade Bay. Early in the afternoon they gained some considerable eminences, but were glad to return to the ship, for looking inland from the points they had attained, they reported "nothing was to be seen, but barren mountains, with huge craggy precipices, disjoined by valleys, frightful to behold." A few scarce plants were gathered on those elevated points, before a squall of wind the next day brought hail and snow, by which all the hills and mountains around were whitened. Of these rarer vegetables may be mentioned, *Forstera sedifolia*, Linn. fil., *Pimelea Gnidia*, Vahl, and some *Compositæ*, referred by Forster to *Arnica* and *Aster*, the latter, probably, species of *Celmisia* of Gaudichaud.

The natives of this southern bay are few in number, and were found to consist of but three or four families, who manage to exist on fish with which their shores teem; for, excepting water-cresses and celery, no esculent vegetable was observed. Indeed the stormy unsettled character of the climate generally appears of itself quite unfavourable to a large population on any part of the middle island, which Cook describes, from his own observation, as thinly peopled, the inhabitants being a wandering race, without any of the social habits to which the kinder, blander climate of the northern, more fertile island, every where so fully induces. The same language was found spoken here, as at other and more hospitable parts of the country; one common tongue, abounding in harmonious sounds, and since discovered by the missionaries to be very copious, every where prevails.

The kindness and nobly generous feeling toward savages of our great commander, soon won the hearts of those wretched outcasts of the human race, whom he met with wandering on the shores of the bay, or inhabiting its ever-misty woods. Friendly interviews followed, but the natives, as they gathered confidence enough to visit the ship, and remain on board, at an early period manifested, like their northern countrymen, a disposition to lay hands on every thing they saw, excepting the muskets, which they would not touch, having been taught by the slaughter they had seen made among the wild fowl by Cook and his people, to regard them as horrid instruments of death.

The survey of Dusky Bay having been completed, Cook stood to the North and

again visited Queen Charlotte's Sound, where he found his consort, the Adventure, which had been separated from him at sea; and after a short stay at anchor, in which the two Forsters had some opportunities of looking at the plants previously investigated by the illustrious Naturalists of the first voyage, the two ships proceeded to the South and East, to traverse icy seas, in search of those new lands, that it had been previously imagined might exist in those high and inhospitable latitudes.

The year 1777 found the enterprizing Cook again on the coasts of New Zealand. He was then prosecuting his third voyage of discovery, and on the 12th of February entered into Queen Charlotte's Sound to replenish his water-casks, and procure firewood. Mr. Wm. Anderson, the surgeon of his ship (the Resolution) undertook the investigation of the Natural History of the several countries that were to be visited in that last, that disastrous voyage of our very experienced navigator; but during the stay of the Resolution it does not appear that any plants were gathered which had not been found in the previous voyages.

An interval of fourteen years now took place, ere these islands were again visited; the year 1791, however, saw Captain Vancouver on their shores. That intrepid navigator had been despatched by the British Government with two ships (the Discovery and Chatham) to inquire into the commerce and the water-communication that might facilitate it, between the North-western and South-western coasts of America, &c., and on the voyage out he discovered King George's Sound, and made these islands at Dusky Bay. There he gave the surgeon of his ship, our amiable friend Mr. Menzies, the opportunities of which he abundantly profited, of examining the plants of its woods, and especially of looking into the beautiful subjects of its considerable antarctic vegetation. The results of the investigations of that gentleman, as far as regards these latter, have been partly illustrated by Sir W. J. Hooker, in his splendid and elaborate works, the *Icones Filicum* and *Musci Exotici*.

We now go on to take a still more rapid notice of the scientific visits of Europeans, since that period to the present day. The next visitor was Captain Duperrey in the corvette La Coquille, who had been despatched by the French Government, in 1822, to make discoveries in the southern hemisphere. That officer touched on the coasts of New Zealand, and afforded those attached to Botanic Science the opportunity of gathering a few plants. The same vessel, re-named L'Astrolabe, commanded by Captain Dumont d'Urville, who had been the first lieutenant in the preceding voyage, also visited parts of those islands in 1827, and with the aid of M. Lesson, formed some collections of the plants of Cook's Strait, the River Thames, the Bay of Islands, and other points on the eastern coast, on which the scientific men who had been associated with the immortal Cook, had long before taken their ample gleanings.

The visit of Allan Cunningham in 1826, was, however, of another and a less transient character; for residing, as he did, at Port Jackson, as His Majesty's Botanist, he made his voyage over to the Bay of Islands, and there entered on a wandering life with the natives, occasionally taking up his quarters at the missionary stations. On that northern island, he was engaged during nearly a period of five months, collecting the indigenous vegetation. By the aids generously afforded him by the gentlemen of the mission, at the several stations, he examined the rivers Kaua-Kaua, and Keri-Keri on the eastern, and the Hokianga river on the western coasts. He also traversed the country intermediate to those shores, where the island may be said to exceed sixty miles in width; and during a month's stay at Wangaroa, a port on the eastern coast, his collections were materially enriched with the products of its primæval forests. In January, 1828, he returned to Port Jackson, greatly gratified by the kindness he had received from the missionaries, as well as by the general

esteem in which he was held by the natives; and satisfied with the gathering of plants he had effected, under the circumstances of, in part, an unfavourable season, comprising, nevertheless, about three hundred distinct species, with ample duplicates; and although many have since proved to be among the original discoveries of Sir Joseph Banks, some are ascertained not to have been previously observed by other Botanists, and among these are some new genera.

It is but justice to the memory of Mr. Charles Fraser, a former Colonial Botanist at Sydney, to notice the visit of a day, paid by that indefatigable and generous traveller to the Bay of Islands in 1825, in one of His Majesty's sloops of war, then stationed at Port Jackson. In the passing stay of only a few hours, that laborious Botanist collected specimens of an interesting selection of the plants of its shores, taking up many living examples of the vegetable products to establish in the Botanic Garden at Sydney.

In the year 1833, his successor in the direction of that Colonial Garden, the late Mr. Richard Cunningham, having been directed by the Local Government to attach himself to His Majesty's ship Buffalo, then about to proceed on an experimental voyage for spars to the coasts of New Zealand, effected a more leisurely sojourn among the inhabitants of that country than any scientific stranger who had preceded him. But a sketch of the several excursions of that indefatigable and much to be lamented Botanist in New Zealand, has already appeared in this work (at p. 210 of the present volume), while the botanical results of his visit will be seen in the subsequent synopsis.

Now the materials gathered, for a more extended view than has already been given of the Botany of these islands, of which so much remains yet to be effected by future discriminating Botanists, have been gleaned from the several works, in which occasional notices of those more considerable collections of plants already referred to that were gathered in Captain Cook's first voyage have been published, as also from the *Prodromus*, published by Mr. George Forster, in 1786, and from the works of Professor Sir W. J. Hooker, and that recently published by M. Achille Richard. To these, adding the actual discoveries of Mr. R. Cunningham and those of his brother previously, the whole amount to six hundred and forty distinct species—a number, two-thirds more than what has been enumerated in the last-mentioned work of M. Richard, published only four years ago.

If to this aggregate number of species, thus got together and here enumerated, sixty be added, as in all probability, comprehending the remaining number of plants of the first voyage of Cook, which are preserved in the Banksian Herbarium, and continue yet unpublished, seven hundred distinct plants may be said to be the number at present known of the Flora of these islands. But when we consider how little has been seen of the Botany of the northern island, notwithstanding that Europeans (engrossed truly in mercantile speculations) have now been several years settled on its coasts,—that the plants of the interior of its more expanded parts from the eastern to the western shores, which lie in the parallels of 38° and 39°, are absolutely wholly unknown, for no Botanist would deem it prudent to attempt a penetration, whatever his zeal may be, to its inland districts, through which extirpating civil wars so frequently rage—when we glance at the map, and perceive its snowy peaks, and especially that of Mount Egmont, on the immediate western coast, the apex of which towers fourteen thousand feet above the ocean, by the waves of which its base is washed, the upper part from the peak downwards, to an extent of five thousand feet, being clothed with eternal snows—in fine, when we reflect upon the fact, that (excepting at its northern shore, in Cook's Strait and at Dusky Bay, on its South-western coast) the Botany of the larger or middle island is, to this day, veiled from our knowledge, we cannot but ex-

claim, what a rich store of vegetable productions remains yet to be laid before us! for that here given is, perhaps, but a tithe of what may one day be shown us—but a foretaste, to excite our desires to behold what the future labours of Botanists may, it is to be hoped, ere long, lay open to our eyes. Long since has that learned Botanist, Mr. Brown, remarked, that the character of the New Zealand Flora, known to us chiefly from the materials collected by Sir Joseph Banks, is to a considerable degree peculiar; although it bears also a certain affinity to those of the two great countries between which it is situated, and approaching rather to that of *Terra Australis,* than to South America.[1] The following brief concluding remarks will confirm these observations.

In the vast Order *Leguminosæ,* so extensively distributed over the globe, so widely scattered in South America, and so abundant in their characteristic genera on the Australasian Continent, that family is absolutely limited to five plants in New Zealand; and what is worthy of observation, three of the genera they constitute are almost confined to those islands, viz. *Edwardsia, Carmichaelia,* and *Clianthus.* No plant of *Mimoseæ* has yet been seen in New Zealand, numerous as they are on the two continents.

Of *Proteaceæ,* a family so extensive in New South Wales, especially between the thirty-third and thirty-fifth degrees of latitude, as to form a very striking feature of its Flora, moreover abundant in southern Africa, and not unfrequent in South America, within the same parallels (witness, in the latter country, the genera *Rhopala, Embothrium, Guevina,* and *Lomatia*), only one plant has been hitherto known to Botanists to represent that magnificent Order in New Zealand, and that has been until recently, regarded as forming a genus[2] peculiar to that country.

The genus *Plagianthus* of Forster, of the family of which Botanists are divided in opinion, is perhaps limited[3] to those islands, and now consists of three species. Among the other remarkable plants constituting genera not known in other countries, may be simply noticed one having a close affinity with *Brexiaceæ* and *Celastrineæ,* and in habit and general structure of flower according with the solitary genus of the former, but differing essentially in the character of the ovarium: and another, equally curious, that may be referred to *Bombaceæ,* with monadelphous stamens, and as far as it has been observed, a five-angled, five-celled ovarium; to which the name of *Hoheria* is here proposed to be given.

The *Coniferæ,* as also the *Myrtaceæ,* although in neither family are there any genera that can be said to be limited to New Zealand, still, furnishing as they do, each several species, and these affording large and valuable timbers, they give a very striking character to the sylvan scenery of the northern islands especially. The genera of the former family are referable to *Dammara, Dacrydium, Podocarpus,* and *Phyllocladus;* and those of the latter, to *Metrosideros, Eugenia,* and *Myrtus.* Those *Coniferous* genera that have been referred to *Dacrydium* (Soland.) and *Podocarpus,* require certainly a further examination of more perfect specimens than have been hitherto seen by Botanists, in order to determine fully the genera to which the several species really belong.

Lying, as the islands of New Zealand do, between the two great continents of South America and Australasia, in which latter may be included Van Diemen's Land, it may not wholly be uninteresting to the botanical reader to observe the affinities

[1] General Remarks on the Botany of Flinders, Voy. App. 2. p. 589.

[2] Within the last ten years, a species of *Persoonia,* a genus hitherto considered entirely confined to the Australian Continent, was observed at Wangaroa on the eastern coast of New Zealand. The *Embothrium strobolinum* of M. Labillardière, a plant, regarding whose genus, as also the habitat assigned it by that author, doubts have been entertained by Botanists of late years, Mr. Brown has had an opportunity of examining, and from the structure of the ovarium, he is of opinion that it is a second species of *Knightia.* It is indigenous only to New Caledonia.

[3] Sir W. J. Hooker has referred a plant of Van Diemen's Land to this genus with a mark of doubt.

that exist between portions of the three countries, by genera closely allied, and forming links in the connexion in the same family. Thus, of *Magnoliaceæ*, South America has its *Wintera*, New Zealand its *Drimys*, and Van Diemen's Land a *Tasmannia*. Of *Onagrariæ*, the two former countries furnish their *Fuchsias*, whilst Australasia has its *Epilobia*. As belonging to the *Atherospermeæ* of Mr. Brown, Chili and New Zealand have each a *Laurelia*, and the type of M. Labillardière's genus *Atherosperma* is frequent in the humid woods of Van Diemen's Land.

Of *Ericeæ*; whilst *Gaultheria* exists in both Van Diemen's Land and New Zealand, *Andromeda* occupies the bogs in the higher latitudes of South America. Again, in *Rosaceæ*—*Rubus*, and *Acæna*, both more abundant on the continent of South America, have representatives also in the other two countries.

As belonging to *Escallonieæ*, R. Br., the type of the Order whence it derived its name, a large genus of Peru and Chili, has another, very closely allied to it, entitled by M. Alph. De Candolle, *Quintinia*, both in New Zealand and New South Wales, whilst *Anopterus* (Labill.) inhabits the damp shady forests of the southern parts of Van Diemen's Land.

Further, as belonging to the allied family *Cunoniaceæ*—*Weinmannia*, a genus chiefly of South America and the islands thereto contiguous, is represented in New Zealand by genuine species, as well as by *Leiospermum*, Don; and *Ackama*, A. C.; whilst the Order is shown in the cooler parts of Australasia, by *Callicorma*, *Anodopetalum* (A. C. MSS. ined.), *Ceratopetalum*, and others.

Of the Order *Araliaceæ*, abounding in plants of remarkable habit, and found generally in South America, both *Panax* and *Aralia* are to be observed in dark and humid woods, on the coasts of New Zealand and New South Wales; whilst *Rutaceæ*, so frequent and so diversified in genera on the two continents, has just barely an existence in New Zealand, viz. in *Melicope*, where to Forster's species, another is added. Another instance of affinity will suffice. The genus *Astelia*, an Epiphyte of *Junceæ*, inhabits rocks and trees in Van Diemen's Land, in New Zealand, and in the colder and higher parts of South America; and an instance occurs of the same plant, viz. *Goodenia repens*, Br., being indigenous to the sandy shores of these several countries. There are, however, certain families of plants, frequent on the interjacent islands of New Zealand and the Australasian continent, that are wholly wanting in South America. Witness *Epacrideæ*, which, as Mr. Brown has justly observed, constitutes one of the peculiarities in the vegetation of the more temperate parts in the latter great country; while in New Zealand nine plants have been observed, and of these the species of *Dracophyllum* are very striking in the drier forests.

The same remark applies to the genera *Pimelea*, *Pittosporum*, to certain of *Halorageæ*, and to those genera of *Orchideæ*, *Thelymitra*, *Orthoceras*, *Microtis*, *Acianthus*, *Pterostylis*, and *Gastrodia*.

Certain genera, common to Europe, furnish species peculiar to those islands. The following may serve as examples, viz. *Samolus*, *Veronica*, *Anchusa*, *Lobelia*, *Senecio*, *Viscum*, *Hydrocotyle*, *Tillæa*, *Myriophyllum*, *Coriaria*, *Geranium*, *Linum*, *Drosera*, *Ranunculus*, and *Clematis*.

Finally, the following short list will show, that identically the same species of plants are occasionally indigenous, both to Great Britain, and to those remote islands of the southern ocean, viz. *Sargassum vulgare*, Agardh.; *Rhodomela pinastroides*, Ag.; *Laurencia obtusa*, Lamour.; *Gelidium corneum*, Lamour.; *Halymenia furcellata*, Ag.; *Parmelia pulverulenta*, Ach.; *P. perlata*, Ach.; *Cetraria glauca*, Ach.; *Sticta aurata*, Ach.; *Cenomyce rangiferina*, Ach.; *Ramalina farinacea*, Ach.; *Usnea florida*, Ach.; *Collema nigricans*, L.; *C. tremelloides*, Ach.; *Sphagnum latifolium*, Hedw.; *Hymenophyllum Tunbridgense*, Sm.; *Scirpus lacustris*, L.; *Eleocharis acicularis*, Br.; *Isolepis setacea*, Br.; *Juncus filiformis*, L.; *J. effusus*,

L.; *J. maritimus*, Lam.; *Typha angustifolia*, L.? *Potamogeton natans*, L.? *Chenopodium glaucum*, L.; *C. maritimum*, L.; *Rumex crispus*, L.; *Plantago major*, L.; *Calystegia sepium*, Br.; *C. Soldanella*, Br.; *Sonchus oleraceus*, L.; *Gnaphalium luteo-album*, L.; *Arenari amarina*, L.; *Stellaria media*, Sm.; and *Nasturtium sylvestre*, Br.

It simply now remains for the Editor to state that this little synopsis of the plants of New Zealand, which has been prepared as well from the works of authors as from materials in his own possession, has received his utmost attention, and his endeavours to render the enumeration as complete, and its various details as copious as possible; at the same time, he cannot, in due candour, but express his apprehension that errors may be found in it, which the botanic reader will be pleased to regard with indulgence, when he perceives the general design has been to afford a better view of what is now known of the Flora of those islands, than has already been given to the public, as well as to furnish a mass of information, not, it is hoped, devoid of interest, regarding the uses to which the native inhabitants apply certain of their plants, their own name of each kind, so far as it has been accurately ascertained, being also given in the synonymy of the species. Where certain plants, long since published, have been described vaguely or insufficiently by botanic writers and others, very nearly allied, of recent discovery, appear with them in the following pages, new diagnoses are given, in which their respective specific differences are fully and clearly defined; and where the Editor has had, in his own New Holland Herbarium, species as yet unpublished, that belong to genera of which other species are of frequent occurrence in those islands, the characters of the Australian, previously undescribed plants, are occasionally given at the foot of the page; and thus, by these additions of new, although foreign matter, he humbly trusts this his little work will be regarded with more interest.

Finally, care has been taken to note the particular localities at which every plant has been found, as also to give chronologically the dates at which it has been gathered by Botanists, in order that the discoverer may be duly accredited for his researches, whilst first in the field.

(To be continued.)

ON THE SOURCES AND COMPOSITION OF GAMBOGE, WITH AN EXAMINATION OF SOME ANALOGOUS CONCRETE JUICES.

By ROBERT CHRISTISON, M.D., Professor of Materia Medica, in the University of Edinburgh, &c.

[*Read before the Royal Society of Edinburgh, March 7th*, 1836.]

GAMBOGE, one of our most important pigments, as well as a very valuable drug, appears to have been first made known in Europe little more than two centuries ago. It was first publicly noticed by Clusius, or De l'Ecluse, at one time keeper of the Botanic Garden at Vienna, and afterwards Professor at Leyden. He succinctly mentions it among various resins and concrete juices brought to him from China by a Dutch Admiral, Van Neck, in 1603; describes it under its oriental name of Ghittaiemoû, as a concrete juice of great purity, of a tawny colour, and tinging the saliva yellow; and adds, that it was used in the East for evacuating dropsical swellings, which it accomplishes without occasioning any inconvenience.[1] Although it probably soon became a familiar substance in the art of painting, it was long comparatively neglected in the practice of medicine. For it did not obtain a place in the European Pharmacopæias till after the commencement of the subsequent century; and it was so much distrusted, on account of its poisonous properties in large doses, that even in the middle of that century, as we learn from Murray of Göttingen, it was chiefly used by those who were not afraid of being thought experimentalists in physic.[2] Now-a-days, however, its properties

[1] Caroli Clusii Exoticorum, Lib. iv. cap. viii. page 82. Antwerp. 1605.

[2] Commentationes Gottingenses, ix. 171. 1788.

are well known; and although it continues to be regarded with justice as an active irritant poison, it is also universally acknowledged to be, under due regulation, one of the safest of the more active purgatives.

The source of Gamboge has long been a subject of doubt and controversy among Pharmacologists and medical Botanists; nor are the opinions and information, even of the most recent authors, by any means satisfactory. In order to understand this inquiry thoroughly, it is necessary to be in the first instance distinctly aware, what are the articles to which the name of Gamboge is usually given, and whence they are obtained.

In point of fact, a considerable number of kinds of Gamboge, differing more or less from one another in quality, and even in nature, as well as in their place of origin, are known in commerce. The most important and finest qualities are generally considered to come from the kingdom of Siam, and are imported into England from China by way of Singapore. Among these the wholesale druggist distinguishes by name at least two, and generally three varieties—*Pipe* Gamboge, *Cake* or *Lump* Gamboge, and *Coarse* Gamboge. Pipe Gamboge, which is invariably the finest, has sold in the London market during the last eight years, at prices varying from two shillings and ten-pence to five shillings a-pound, exclusive of duty.[1] Cake or Lump Gamboge is sometimes very nearly equal in quality to the last, but is more commonly somewhat inferior, and therefore sells for at least three-pence a-pound less. The two qualities are sometimes mixed in the same packages; sometimes each package contains but one; and frequently, on the other hand, the cases contain not merely Pipe and Cake Gamboge, but likewise more or less of a very inferior sort, by the presence of which the price is materially affected. This inferior sort again, of which there are probably many varieties confounded together in the rude nomenclature of the English drug-market under the name of *Coarse* Gamboge, and which will be seen presently to be nothing else than a *Cake* Gamboge of low quality, often constitutes the entire contents of the package. In its crude state this is quite unfit for the purposes of the painter, and is equally rejected for medicinal use; and consequently it bears so contemptible a character in the market, as to bring scarcely tenpence a-pound, when the other sorts are worth three or four times as much. For this statement I am indebted to Mr. Stead, an extensive and experienced wholesale druggist in London.

Most Pharmacologists and medical Botanists have also referred to Ceylon as another commercial source of Gamboge; but commonly with the addition, that this kind is of very indifferent quality. That the island of Ceylon produces a variety of Gamboge is notorious; and that it either does, or with due care may, produce true Gamboge of the best quality, will, I hope, be proved in the course of the present paper. But the notion that Ceylon Gamboge is an article of commerce between that island and Europe, is, I am persuaded, a complete mistake. Gamboge, possessing the external characters of the specimens of Ceylon Gamboge in my hands, is never to be met with in the shops of this country; and on referring to the gentleman whose authority has been already quoted, I learn from careful inquiries made by him among the most experienced drug-brokers and merchants in London, that no shipments of Gamboge are ever made at Ceylon for this country, and that the whole of what is imported into England comes from China by way of Singapore. I have also been since informed, in a letter from Mrs. Colonel Walker, at Colombo, written in October last (1835), that Gamboge does not appear in the Custom-House export-lists of that port, which would have been the case had any of it been sent thence to Britain. Accordingly Ceylon Gamboge is altogether a rare substance in Europe, and is to be met with only in the cabinets of the curious. I have been unable, indeed,

[1] Martin's History of the British Colonies, i. 224. *Table.*

to hear of any specimens existing even in the collections of this country, except those I have examined.[1]

To these facts regarding the commercial sources of Gamboge, I may add one, which, so far as I am aware, is not known to Pharmacologists, and which is not unimportant in relation to an opinion I have deduced from chemical analysis, as to the nature of one variety of the drug, namely, that a kind of it, resembling in appearance the Gamboge of Ceylon, is also produced in the island of Borneo. This is obtained at the towns of Mampára and Pontianah in Borneo, is conveyed thence by the Malay coasters to Singapore, and is there bought by the Chinese, to be purified and made up for the European market. This information I owe to an intelligent pupil of our University, Mr. James B. Allan, who some years ago saw the article at Singapore, in the course of its passage into the hands of the Chinese.

Considering the great varieties that exist in the commercial qualities and origin of Gamboge, together with the inaccessible nature of the countries whence some of them are obtained, it cannot appear surprising that the botanical source of the drug is involved in some doubt and obscurity.

The first notice we have of an attempt to refer it to a particular tree, is by Bontius, who practised medicine early in the seventeenth century at Batavia, and who seems to have been familiarly acquainted with the drug and its effects. In his well-known work, published after his death by Piso, a Euphorbiaceous plant is described and figured under the name of *Esula Indica;* and he says it yields a milky juice from wounds made in its stem, and that "it differs neither in form, figure, nor manner of growth," from the plant which yields the Gamboge of Cambodja in Siam.[2] For nearly a century the opinion of Bontius seems to have regulated the doctrine of medical Botanists, so far as regarded the source of Siam Gamboge. But not long after the publication of his treatise, it was also announced, chiefly through the researches of Hermans, who resided at Colombo for seven years subsequent to 1670, and was afterwards a Professor in the University of Leyden, that other varieties of Gamboge were obtained from two trees growing in Ceylon, which are at present generally believed to be the *Garcinia Cambogia* and *Stalagmitis Cambogioides* of modern Botanists. In a letter addressed in 1677 to Syen, another Leyden Professor, and the annotator of Van Rheede's *Hortus Malabaricus*, Hermans observes, that both trees afford a kind of Gamboge, but that the latter yields the more esteemed variety.[3] Although Syen, in his note, cautions the reader against confounding these Gamboges with the Gamboge of the shops, which was then, as now, derived entirely from Siam, and although Hermans himself, in a subsequent work of his own upon Materia Medica, published in 1710, seems to refer Gamboge incorrectly to the plant which is now known to be the *Garcinia Cambogia*,[4] it will nevertheless appear from the sequel, that in mentioning the other species of tree to his countryman Syen, as the source of the best kind of Ceylon Gamboge, this Botanist has really earned the merit of being the first to indicate the true origin of the Cingalese variety of the drug. Since that time almost every attempt which has been made to render our information on the subject more correct or more precise, has in reality had a tendency directly the reverse. In 1748, Linnæus, in publishing a list of Ceylon plants from certain recovered manuscripts of Hermans, which had been missing for nearly fifty years, committed the strange

[1] It may be well here to complete the commercial history of this substance by adding, that, according to information communicated to me by Sir Whitelaw Ainslie, and obtained by him from a Madras native practitioner, Ceylon Gamboge is now an article of sale in the bazaars on the Coromandel coast.

[2] Jac. Bontii Hist. Natur. et Medic. Indiæ Orient. ex Edit. Pisonis. Amstelædami 1658. Lib. vi. Cap. lvii. p. 153.

[3] Van Rheede. Hortus Malabaricus, 1678. i. 42. tab. 24.

[4] Pauli Hermanni Cynosura Mat. Med. ante sedecim annos in lucem emissa, &c. cum annot. Henninger et Boecler, 1726. p. 685.

mistake of confounding under one name both of the trees described by the Dutch Botanist.[1] And in 1788, Professor Murray of Göttingen, after carefully examining the manuscripts and dried specimens of Koenig, a Polish physician in the Danish service, who was long in the East Indies, and had studied this particular subject with attention, was unlucky enough to take his description from a specimen, which, it now appears, had been patched up from two distinct species;[2] and thus, in constituting a new genus as the true Gamboge-tree, under the name of *Stalagmitis Gambogioides*, he has described a plant which really does not exist, although in almost every modern Pharmacopæia it has been adopted as the botanical source of officinal Gamboge. Such is one of the results of the investigations of my colleague, Dr. Graham, who further makes out that Ceylon Gamboge is produced by a tree which must constitute an entirely new genus, and to which he proposes to assign the name of *Hebradendron Gambogioides*. Any one who compares Dr. Graham's description with the brief notice given by Hermans, must come to the conclusion, that the latter author took his description from the very same plant.

Although the inquiries of Dr. Graham have made us accurately acquainted with the true source of the Gamboge of Ceylon, it does not absolutely follow, that we are likewise acquainted with the true botanical source of the common article of the shops, the Gamboge of Siam. In truth no competent European Botanist has hitherto seen either the Siam tree, or specimens from it; for Koenig, on whose authority modern Pharmacologists have for some years assigned officinal Gamboge to the *Stalagmitis Gambogioides*, actually never saw that plant in Siam, and founded his opinion partly on a very imperfect description communicated to him by a priest who was no Botanist, and partly on the supposition that, as the Bhoodist religion is believed to have passed from Siam to Ceylon, and along with it the practice of painting the temples and holy dresses with Gamboge, the tree which yields Gamboge may have passed from one country to the other at the same time.[3] When we add, however, to the presumptions thus constituted that, as will presently be seen, the Gamboge of the two countries is as nearly as possible identical in composition and properties, the probability certainly becomes very strong, that both varieties are the produce of the same species of tree.

Gamboge has long been an object of interest in a chemical point of view. In the earlier periods of organic chemistry it was considered the most perfect variety or type of the gummy-resinous principle, as presenting in the highest degree the properties of a substance intermediate in chemical relations between gum on the one hand, and resin on the other. It is now universally admitted that there is no such principle as a gum-resin, the name being retained in the chemistry of the present day merely as a convenient term for a set of natural productions consisting of several principles. But the gum-resins are still with justice considered as among the most interesting of all the natural productions of the vegetable world; and none has been hitherto discovered which presents their general characters better marked than Gamboge.[4]

Passing by the earliest analyses, such as those of Boulduc,[5] Cartheuser,[6] and Geoffroy,[7] which lead to no useful result, it will be sufficient for me to mention the researches of Braconnot and of John, by each of whom its true nature was satisfactorily ascertained. Braconnot, in 1808,

[1] Flora Zeylanica sistens plantas Indices quæolim, 1670—1677 lectæ fuerea Paulo Hermanno. Amstelædami, 1748. p. 87.

[2] Commentationes Gottingenses, ix. 169.

[3] Commentationes Gottingenses, ix. 179.

[4] Hermans, it is worthy of remark, had an accurate idea of its nature:—"Virtutem suam purgantem," says he, "paucæ resinæ, sed largiori gummati habet inclusum." Cynos. Mat. Med. p. 685.

[5] Hist. de l'Acad. des Sciences de Paris, 1701. p. 179.

[6] Fundamenta Materiæ Medicæ, p. 559. Francofurti, 1749.

[7] Geoffroy, Matière Médicale, ii. 682.

examined the finest variety of Gamboge, and concluded that it is composed of eighty per cent. resin, and twenty per cent. gum; that the gum is acid in its re-action on vegetable colours, and allied in nature to plum-tree gum; that the resin possesses the colour of the crude drug, is converted into an orange or cherry-red soap with potassa, yields a little oxalic and malic acids and a larger quantity of a bitter principle on being treated with nitric acid, and when subjected in fine powder to a stream of chlorine, forms a colourless compound with that gas, which is permanent, except under the influence of destructive distillation, concentrated acids, and other powerful decomposing agents.[1] In 1813, John of Berlin, apparently unacquainted with the prior investigations of Braconnot, also examined this substance, and obtained the same principles, but in very different proportions, the resin amounting in his analyses to eighty-nine or ninety per cent., and the gum to nine and a half or ten and a half only.[2] It may be added, that he was led by this analysis to throw doubts, as others indeed had done before him, over the belief, at that time general, in the existence of a gummy-resinous principle as a simple proximate constituent of vegetable substances. For in regard to Gamboge, held to be one of the most characteristic examples of such a principle, he proved not merely that it may be resolved into true gum and true resin, but likewise that it may be re-produced by simply triturating the resinous part with a due proportion of gum-arabic.

The inquiries of John and Braconnot having been confined to a single variety of Gamboge, while at least three principal varieties are known in commerce, it occurred to me that it might be desirable to ascertain the composition of each—first, in order to settle the cause of their respective qualities and of the preference given to one particular kind for the art of painting as well as in medicine—and secondly, in the hope that their respective analysis might throw some light on the question of their botanical origin.

The specimens of Pipe and Cake Gamboge of Siam, which were used in the following analysis, were chosen for me by Mr. Duncan, an intelligent druggist of this city, as characteristic examples of the two varieties; and the specimens of Pipe Gamboge, which is the most important of the whole, were declared by an eminent professional colourist to be as fine as he had ever seen. The specimens of Coarse Gamboge were obtained for me by an experienced wholesale druggist in London. Of Ceylon Gamboge I have been fortunate enough to obtain several authentic and characteristic examples. One was left in the museum of my predecessor, Dr. Duncan, junior, to whom it was sent about seven years ago by Mr. David Anderson Blair from Colombo, as a specimen of the ordinary Gamboge of Ceylon. Another was lately transmitted by Mrs. Colonel Walker, also from Colombo, to my colleague, Dr. Graham, as a specimen of the exuded juice simply as collected from the tree and dried in moulds for preservation. A third is a beautiful and undoubted specimen of the exuded juice concreted on the bark of the tree which yields it. This was also sent by Mr. Anderson Blair to the late Dr. Duncan.

1. *Pipe Gamboge* is so termed in the nomenclature of the drug-market, from its peculiar form. It occurs chiefly in cylindrical masses, from three-quarters of an inch to nearly three inches in diameter, commonly hollow, and often doubled upon themselves, and cohering. Not unfrequently several of these pipes or cylinders are firmly accreted into irregularly-shaped cakes or balls, two or three pounds in weight; in which, however, the remains of the cavities may be traced, though much flattened. The surface of the unaccreted cylinders is dirty greenish-yellow, and striated—evidently from the impression of the reed-moulds into which it is run when soft.

[1] Analyse comparé des Gommes-résines, Annales de Chinie, lxviii. 33.—1808.

[2] Chemische untersuchungen, mineralischer, vegetabilischer, und animalischer substanzen, iii. 190.—1813.

Where several cylinders have been joined together, and squeezed into a cake or ball, the mass is usually wrapped in large leaves, which appear to belong to a malvaceous or bombaceous plant. Pipe Gamboge is very brittle, and presents a somewhat conchoidal fracture, the surface of which is smooth, brownish-yellow in tint, and glimmering in lustre. It becomes bright Gamboge-yellow wherever it is frayed or rubbed, and very readily forms an emulsion or paste of the same hue when rubbed with the wet finger. It has scarcely any taste; but after a short time produces a sensation of acridity, especially in the back of the throat. Neither has it any smell; yet the fine dust, raised in pulverizing it, quickly irritates the nostrils, even in quantities inconceivably minute, exciting a profuse flow of mucus, and some sneezing, but without pain.

This variety of Gamboge is familiarly known to be an excellent and powerful purgative, which in the dose of three, five, and seldom more than seven grains, produces profuse watery discharges; nor has there ever appeared to me any reason for dreading its effects, as our predecessors did; for its action is seldom or never accompanied with much pain or other uneasiness, if it is thoroughly pulverized with some other finely-pulverizable substance, such as cream of tartar. Yet on the other hand, it is a dangerous poison in large doses; one drachm has proved fatal; and the cause of death is violent inflammation of the bowels. I believe that the occasionally fatal effects of a nostrum much in vogue in the present day, under the name of Morison's Pills, have been satisfactorily traced to an over-dose of Gamboge.

It was this variety which Braconnot analyzed. As for the analysis of Professor John, which seems also to have been applied to the Pipe Gamboge, it differs so entirely from what I have obtained from all the varieties I have yet examined, that some error must have been committed in his proceedings. In all probability the error arose in his employing rectified spirit for separating the principles from one another; because rectified spirit, in dissolving the resin, takes up also a considerable part of the gum. The same objection is applicable to the analysis of Braconnot, though he has obtained more nearly the true proportions of the principles.

The best solvent for separating the resin of Pipe Gamboge is sulphuric ether. When agitated with the powder, a lively orange-red solution is obtained, which becomes Gamboge-yellow by dilution, and continues to show this tint when very greatly diluted, proving the exceeding intensity of the colour. On distilling off the greater part of the ether, and then driving away what remains by heating the residue in an open porcelain cup, a very beautiful, brittle resin is obtained, which has in thin layers a deep orange-colour and complete transparency, and in thicker masses a cherry-red tint, so dark as to produce almost complete opacity, and which possesses in fine powder a lively Gamboge-yellow hue.[1] It is remarkable that the very volatile fluid, sulphuric ether, adheres with great force to this resin, insomuch as to be the source of much trouble, and even error in a quantitative analysis. The vapour-bath heat of 212° F. I found insufficient to drive off so much ether as to leave the resin firm when cold; even at the temperature of 270°, maintained by means of a muriate of lime bath for six hours, so large a quantity was retained, that the detached principles almost always weighed conjunctly three per cent. more than the crude subject of analysis; nay, a heat of 400° subsequently applied for four hours by an oil-bath, which I considered the highest temperature to be safely applied to the resin, and which sent off copious bubbles of ethereal vapour, still left a slight surplus of weight in the separated principles when summed up.

The ether leaves, in the case of Pipe-Gamboge, a flocculent matter, which, when thoroughly exhausted by the repeated action of the same fluid, coheres somewhat and acquires a very pale yellowish-white

[1] Its colour is so intense that it communicates an appreciable yellowness to ten thousand times its weight of spirit.

colour. In fine specimens of this Gamboge I have always found the flocculent residuum to be composed entirely of gum, presenting the leading characters of the prototype of the gummy principle named *Arabin*, from its forming almost the entire mass of gum-arabic. It is entirely and easily soluble in cold water, forming a pale yellowish solution, which, when concentrated, becomes viscous, and when dried, forms a transparent, reddish substance, of a mucilaginous taste without acridity. Braconnot thought the gum analogous to that of the plum-tree; which, however, contains a considerable proportion of the insoluble variety of gum named *Cerasin*, a variety entirely absent in Pipe Gamboge.

The proportions of the two principles vary somewhat, as will appear from the following results of trials made with one hundred grains of two distinct specimens apparently of the same quality.

	First.	*Second.*
Resin heated at 400°, till it ceased to lose weight	74.2	71.6
Arabin, or soluble gum, heated at 212°, till it ceased to lose weight .	21.8	24.0
Moisture discharged by a heat of 270°.........	4.8	4.8
Woody fibre.............	trace	trace
Total....	100.8	100.4

In another analysis so much as 27. 3 per cent. of gum was obtained. But as the resin was not carefully determined, and there was therefore no check on the analysis, the accuracy of that result cannot be positively relied on.

It follows that Pipe Gamboge consists of resin and gum, without any volatile oil, which is a very common ingredient of other gummy-resinous exudations. The large proportion of gum accounts well for its easy miscibility with water, by which, on the one hand, its suitableness for the purposes of the painter is judged of, and which, on the other hand, renders it in medical practice convertible into a smooth and perfect emulsion, without any of the additions usually resorted to for that end.

I have nowhere met with any allusion to the question, in what principle the active properties of Pipe Gamboge reside. Since it consists of nothing else but gum and resin, the natural inference must be, that as gum is always bland and simply demulcent when pure, the acridity will be found to reside in the resin. This I have accordingly ascertained to be the case. The resin of Gamboge, heated to 260° to drive away most of the ether, was administered as a purgative to several individuals alternately with Gamboge itself; and both were found to occasion identically the same effects in kind—the resin, like the crude drug, occasioning profuse watery discharges, without pain or other uneasiness, in the dose of five grains. But its operation was certainly different in degree, the effect being always less in the dose of five or five and a half grains, than from the equivalent dose of seven grains of Gamboge, although care was taken to administer both to the same individuals, and in identically the same circumstances, so far as this condition could be secured. I was at first inclined to imagine that the diminution of effect might be owing to a partial change produced by the heat to which the resin had been exposed. But this idea was necessarily abandoned on subsequent proof being obtained that a higher heat of 400°, which is little short of that required to produce chemical disorganization of the resin, has no further deteriorating influence.

But it may be asked, whether the acridity of Gamboge is a property of the resin itself, or of some principle united with pure resin, and concentrating in itself the whole active qualities of the drug. On this point chemical analysis has not yet thrown any light; nor have I been able to add any thing to what is already known. Certainly no decomposing agent hitherto applied has detached a peculiar active principle from the resin; and it further appears probable that the process of saponification, which might be expected to detach an active principle, if it really were

present, not only has no such effect, but even, according to some Pharmacologists, alters materially the action of Gamboge. For it is stated that Gamboge, converted into a soap by the action of an alkali, ceases to be purgative; so that a dose of twenty grains in this form has none of the usual effect, and on the other hand acquires diuretic properties. If these arguments, however, seem to favour the opinion that the active principle is nothing else than the resin itself, it should at the same time be remembered as favouring the opposite view—that the greater part of pure resins are nearly or entirely inert; and still more, that it has been proved in regard to the closely allied class of vegetable productions, the fixed oils, comprising several acrid species, such as croton-oil, the oil of the physic-nut, and some other energetic purgative oils, that their activity is not inherent in the simple oil, but resides in a peculiar volatile acid principle, which may be detached.

2. Passing next to the *Lump* or *Cake Gamboge*, it must appear evident, that the composition of this variety will vary much according to its quality. At least from what has been said above of its commercial history, it must either vary much, or we must separate from this sort all the kinds often mixed with it, and vaguely known in trade by the name of *Coarse* Gamboge. The finer qualities of it, usually called Cake or Lump Gamboge by druggists, appear from what I have seen, to be tolerably uniform. It is met with in amorphous masses, weighing two or three pounds and upwards, if unbroken. It presents outwardly no striated marks of fibres. It contains visible fragments of wood, and sometimes twigs of considerable size. It is not dense, smooth in texture, and easily frangible, like the Pipe variety, but full of little air-cells, less easily broken, and also much more difficult to reduce into fine powder. Its fracture is not conchoidal, rather splintery, and quite free from any glimmering lustre. Its colour, however, is much the same with that of Pipe Gamboge; its taste and odour are the same; and it very readily forms, with the wet finger, a smooth, bright Gamboge-yellow emulsion. Possibly the finer sorts which approach Pipe Gamboge in price, may also more nearly resemble that variety in external characters than has been here laid down; but I have not met with any such specimens. True Pipe-Gamboge, however, it must be remembered, is often met with in the form of cakes, owing to several pipes or cylinders having been firmly agglutinated while soft.[1]

The chemical composition of Cake-Gamboge is also materially different. It is not, like the Pipe variety, entirely dissolved by the successive action of the two solvents, sulphuric ether and cold water. About eleven per cent. of insoluble matter remains, which in cold water subsides commonly in two layers, the uppermost white, and very finely pulverulent, the lower one grayish, and rather flocculent. The former proved to be fecula, entirely soluble in boiling water, and then giving an abundant blue precipitate with tincture of iodine—the latter quite insoluble in boiling water with even six hours of ebullition, burning entirely away, with the flame and odour of burning wood, and with a mere trace of earthy residue, and therefore apparently woody fibre or lignin. The analysis of two samples gave results nearly concordant, as follows. One hundred grains were used, and all visible fragments of wood were excluded.

	First.	*Second.*
Resin, dried in oil-bath at 400°	64.3	65.0
Arabin, dried at 260°	20.7	19.7
Fecula, dried at 212°	6.2	5.0
Lignin, dried at 212°	4.4	6.2
Moisture	4.0	4.2
Total	99.6	100.1

The proportion between the gum and the resin is here identically the average pro-

[1] Cake Gamboge boiled in fine powder, with water, forms an emulsion, which is rendered deep green by tincture of iodine; while an emulsion of Pipe Gamboge, similarly prepared, merely becomes somewhat tawny.

portion already mentioned as existing in Pipe Gamboge; so that, on simply abstracting the fecula and woody fibre, an article is constituted of precisely the same chemical composition. This circumstance, coupled with the presence of the particular principle fecula, and the vesicular structure of the cakes, renders it extremely probable, if not certain, that Cake Gamboge is not simply a natural production, but rather a manufactured substance—an adulteration. For in the first place, it is the pure exudation *plus* so much impurity; secondly, fecula is not known to be produced from the trunks, branches, or leaves of plants belonging to that part of the botanical system in which the true Gamboge Tree undoubtedly will be found to be properly placed, and it is therefore almost impossible that its presence depends on some mere variety in the period of collection or other circumstance in vegetation; and thirdly, the vesicular texture, so different from the compact, uniform texture of Pipe Gamboge, is exactly what might be expected from the process of wetting the exuded juice, beating it up with other pulverulent substances, and then drying it. It might be objected that eleven per cent. of foreign matter is a small addition for an adulteration. But this amount may, after all, be quite equivalent to the grower's profit from the pure article; and it will presently be seen, that a larger proportion of adulteration may so dilute the yellow tint of the mixture as to render it almost unmarketable.

We cannot doubt that the resin of Cake Gamboge possesses the same effects on the body with that of the Pipe variety. So that this topic may be passed over.

3. The *Coarse Gamboge* of some English druggists is classed by others with the Cake variety, and I apprehend correctly, since chemical analysis shows that it is nothing else than the lowest quality of that kind. I have received two specimens from an experienced London druggist, under the name of Coarse Gamboge, one of which presents very nearly the external characters and composition of what has been described above as Cake Gamboge, while the other, which is greatly harder, more earthy in its fracture, and grayish-yellow in tint, both in mass, in powder, and in emulsion, evidently owes these differences to nothing else but a larger proportion of the same, or at least a similar, adulterating ingredient. The composition of these specimens was as follows for 100 grains.

	First.	*Second.*
Resin, dried in the oil-bath at 380°	61.4	35.0
Arabin, dried at 212° . . .	17.2	14.2
Fecula, dried at 212° . . .	7.8	19.0
Lignin, dried at 212°	7.8	22.0
Moisture disengaged at 350°	7.2	10.6
Total	101.4	100.8

With the ligneous fibre I have also included a trace of sandy particles and other impurities.

4. *Ceylon Gamboge,* as I have seen it, is usually in small irregular fragments, but as originally collected, is in flattish round masses, as if moulded in shallow bowls, weighing about a pound or upwards; and it appears to be composed of aggregated irregular tears, with interspaces and cavities, which are lined with a dark, powdery matter, or with a powder of an earthy appearance. Altogether it seems a very coarse article. But on attentive examination it will be found, that the tears, of which by far the greater portion of it is composed, present the compact texture, smooth fracture, and glimmering lustre of fine Pipe Gamboge; that its powder has an intense Gamboge-yellow tint; and that a smooth emulsion is very readily formed by it with the wet finger. Dr. Duncan, indeed, has stated, that it has not the properties of true Gamboge;[1] and I know he referred to its not being sufficiently emulsive to form a smooth mass with water for the use of the painter. But in this he is not quite correct. The specimen of concrete juice adhering to the bark, which was

[1] Edinburgh New Dispensatory, Ed. 1830, *Art.* Gamboge.

sent to him by Mr. Anderson Blair, is certainly not so emulsive as Siam Gamboge. But the ordinary Cingalese article, also sent by the same gentleman, is much more perfectly so. And the specimens sent by Mrs. Colonel Walker to Dr. Graham, as well as others subsequently sent to myself, comprising a splendid specimen of it adhering to the bark of the tree, seem to me to form with great ease an emulsion nowise inferior in smoothness, and very little, if at all, in liveliness of tint, to that of the very best Pipe Gamboge of Siam. On this point I have taken the precaution of consulting an experienced professional colourist; and he reports that Mr. Anderson Blair's specimens present many fragments quite equal to the Pipe-Gamboge as a pigment, but that it does not mix well with some other colours, such as Prussian blue, and shows a tendency to curdle with them —an objection, however, from which I have since been told the finest varieties of Gamboge are not quite exempt. To this testimony may be annexed that of Mrs. Walker herself, who is a skilful colourist, and who both states in her communication to Dr. Graham, that she finds Ceylon Gamboge quite equal to that of Siam, and has since added, in a very interesting letter to myself, that all the additions sometimes made to it by the Cingalese artists, such as lime-juice, the gum of the *Feronia elephantum*, or lime-powder, are not only unnecessary, but have likewise appeared to her even to injure its tint.

The inference, that good Ceylon Gamboge may be easily put to use in the art of painting, is borne out by its chemical composition. As in the instance of Cake Gamboge, so here, sulphuric ether and cold water do not effect a complete solution, but leave about five per cent. of insoluble matter. This, however, does not contain any fecula; and it appears to be entirely composed of the fibre of the wood and bark introduced accidentally. It presents visible fibres, is insoluble in all simple solvents either hot or cold, burns almost entirely away with a good deal of flame and a smell of burning wood, and has a dark brownish-black colour. The ashes of this residuum, amounting to three per cent. of it, consist of carbonate of lime, with a trace of oxide of iron. The following results were obtained from three analyses of Mrs. Colonel Walker's specimens, evidently different in purity. The quantity used was one hundred grains.

	First.	*Second.*	*Third.*
Resin, heated at 400°	68.8	71.5	72.9
Arabin, dried at 240°.	20.7	18.8	19.4
Fibre of wood and bark, at 212°	6.8	5.7	4.3
Moisture..........	4.6	*not ascertained.*	
Total....	100.9	96.0	96.6
		moisture not reckoned.	

Here it is evident that the proportion of gum and resin to one another is as nearly as possible the same with their proportion in some specimens of fine Pipe Gamboge.

Having arrived at this result, it appeared to me an object of interest to examine the late Dr. Duncan's specimen of concrete juice adhering to the bark, in order to ascertain whether it is generically the same article with the other specimens whose composition has been already mentioned, and whether its composition throws any light on the cause of the inferior miscibility with water which characterizes this in common with some other varieties of Gamboge. I could spare only about four and one-third grains [4.329], without injuring the specimen; but by proceeding carefully, the following results were obtained:—

	Grains.	*Per cent.*
Resin, heated at 400° ..	3.270	75.5
Arabin, dried at 212° ..	0.793	19.0 (Arabin and insoluble residue together)
Insoluble residue, probably Cerasin, because soluble in boiling water, yet not then acted on by iodine	0.029	
Probable moisture, say as in Siam Gamboge.	0.208	4.8
Total....	4.300	99.3

From this analysis it seems to follow, that the present specimen is generically a true

Gamboge. It contains indeed between four and six per cent. less gum than Siam Gamboge, and between two and four per cent. less than the other specimens of Ceylon Gamboge which I have examined; but this difference can scarcely be held the less to constitute it a true Gamboge.[1] Since executing this analysis I have received, through the great kindness of Mrs. Colonel Walker, another specimen similar to that of Dr. Duncan. Although I have not submitted it to analysis, from unwillingness to spoil the specimen, I am satisfied, from the great ease with which it makes an emulsion with water, that this specimen must contain a full proportion of gum.

From the whole of the previous account of the properties and composition of the different kinds of Gamboge, the following conclusions may, I think, be reasonably drawn.

It has just been shown, that the composition of this concrete juice varies somewhat in the respective proportions of its two essential ingredients, as it is produced by the same plant growing in the same climate and country. It is plain, therefore, that a difference in the place of growth of the tree may occasion a similar difference, greater in degree; and consequently that Siam Gamboge may perfectly well be produced by the same species which is known to produce the Gamboge of Ceylon.

It further appears, that the proportion of gum to the coloured resin may vary somewhat, without the emulsive quality of the article being materially altered; but that a very small diminution of the gum below a certain proportion will render the gum-resin incapable of forming a smooth emulsion, which property is indispensable for its employment as a pigment.

In the next place, there can be scarcely any doubt, that the Gamboge-tree of Ceylon may be made to yield, with due care, a fine and perfect Gamboge, so far as concerns the art of painting. And the conditions for success probably are, 1. That the exudation be collected from the tree with more care than at present, so as to be kept free of woody fibre and the darker particles of bark, by which the purity and liveliness of the yellow tint are somewhat impaired. 2. That care be taken to ascertain in what circumstances of season, soil, cultivation, or the like, the exuded juice contains the due proportion of gum, that is, not less than 20.5 per cent. of the gum-resin when perfectly dry. 3. That where the gum is rather deficient, it be supplied by express addition. Probably, indeed, the whole Gamboge of Ceylon may be improved by the addition of three or four per cent. of gum; and at all events some kinds of it require such addition, as seems well known to the Cingalese, who, according to Mrs. Walker, when they use it as a pigment, sometimes add a little of the gum of the *Feronia elephantum*, or Wood-apple. In regard to the first of these conditions, it ought to be known, that, according to the only account hitherto obtained of the mode of collecting Gamboge in Siam, namely, the information communicated to Koenig by a Portuguese priest, who said he had witnessed the process, this variety of the drug is actually prepared not from the bark, but from the leaves, by bending down the branches, cutting the leaves across, and collecting the droppings. Koenig's account certainly does not seem very probable; yet it ought to be kept in view, and subjected to trial in Ceylon. The Cingalese method is to obtain it from the bark, sometimes by making incisions through it, and sometimes by shaving off portions of the outer bark as large as a man's palm. It seems scarcely necessary for me to point out how readily this crude method will lead to the introduction of woody fibre into the article, or how easily the method may be improved so as to exclude such impurity.

As to the use of Gamboge in medicine, I am satisfied that the Ceylon variety possesses the properties of the finest Siam Gamboge in full perfection. Mrs. Walker

[1] On careful comparison, it appeared that the resin of Ceylon Gamboge produces, in solution, the identical tint and intensity of colour which have been already stated to characterize the resin of Siam Gamboge.

says, that in the Island of Ceylon it is used by the native doctors precisely for the same purposes with Siam Gamboge in Europe and elsewhere. I have made many experiments in my Clinical Wards in the Royal Infirmary, with the article sent by Mr. Anderson Blair, and invariably found it at least as effectual as the common drug used in this country. From comparative trials, indeed, made in the same individuals, I am even of opinion, that Ceylon Gamboge is the more powerful of the two, while it is equally safe and free from any accessary unpleasant operation.

In conclusion, then, I may venture to express my firm persuasion, that Europe need not be indebted to Siam alone for its Gamboge; and that, with a little enterprize and due attention on the part of our Government and Settlers in Ceylon, Gamboge of the most esteemed quality may be added to the other European exports of that prolific and highly favoured island.

November 28th. To the observations made above, on the external characters and composition of the different kinds of Gamboge, it may be well here to annex a brief notice of the gambogioid juices obtained from two trees, which have been at different times supposed by some to yield the genuine drug, namely, the *Garcinia cambogia*, and *Xanthochymus pictorius*.

I am here again indebted to Mrs. Col. Walker for my subjects of analysis, having very lately received splendid specimens of the barks of both trees, with their exudations concreted on them.

The exudation of *Garcinia cambogia*, as I am informed by Mrs. Walker, concretes slowly and imperfectly, so as to remain long viscid in the climate of Ceylon. The specimens sent to me, on arriving here, still continued soft enough to receive the impression of the fingers when squeezed between them. The exudation was chiefly in the form of long slender tears, of a clear lemon-yellow tint, without odour or taste, of a distinct resinous appearance, both externally and in their fracture, and wholly incapable of forming an emulsion when rubbed with the wet finger. These properties are alone sufficient to establish it as a substance altogether distinct from true Gamboge; and this distinction is still further shown by its chemical composition.

Suspecting that its softness was owing to the presence of volatile oil, I distilled fifty grains of it with water in an apparatus in which it was easy to measure any fluid given off, to the fourth part of a grain; and after repeated cohobation, there were obtained six grains of a lively-yellow volatile oil, possessing a faint turpentine odour. From another portion, weighing twenty grains, the resin and volatile oil were removed conjunctly by sulphuric ether; and then cold water took up a principle agreeing entirely with Arabin in its characters; after which there was only left a little dark, brittle, fibrous matter, evidently from particles of the bark. The analysis gave the following results:—

	Per cent.
Resin	66.0
Arabin	14.0
Volatile oil	12.0
Fibre of the bark	5.0
Loss	3.0
	100.0

It is not a little remarkable that this exudation, evidently a true gum-resin, and containing, too, a considerable proportion of gum, is nevertheless not emulsive. The resin differs essentially from that of true Gamboge, being somewhat less soluble in ether or rectified spirit, and possessing a colour somewhat different both in tint and in intensity. Its colour is not orange, but rather lemon-yellow; and its solution is so much less intense in tint than that of the resin of Siam or true Ceylon Gamboge, that the last two present an equal depth of shade when dissolved in ten times as much spirit as the other.

The physiological effects of the gum-resin of *Garcinia cambogia* on the animal body form a distinction between this substance and true Ceylon Gamboge, not less

characteristic than their respective chemical composition or sensible properties. I have nowhere met with any account of the effects of this gum-resin, apart from those of true Ceylon Gamboge with which it has been commonly confounded. But I have made some trials with it, which prove that it does not by any means possess the powerful cathartic action of Gamboge. One individual took first ten, and afterwards fifteen grains, finely pulverized with bitartrate of potash, but without experiencing any effect whatever; and another took eight grains of the resin, or the equivalent of twelve grains of the crude substance, also without the slightest perceptible effect. These quantities are about thrice the average doses of true Gamboge.

On the whole, then, looking to the external characters, the chemical composition, and the physiological operation of the gum-resin of *Garcinia cambogia*, it seems very difficult to account, except on the supposition of loose observation or hypothetical inference, for the belief long generally entertained, and still not abandoned by some,[1] that this tree yields either the Gamboge of commerce, or a substance analagous to it.

Mr. Royle having expressed an opinion in his *Illustrations of the Botany of the Himalayah Mountains*, that a kind of Gamboge may also be produced by another species of the natural family *Guttiferæ*, namely, the *Xanthochymus pictorius*,[2] it seemed to me desirable to determine that point also by an analysis of its resinous exudation, which Mrs. Walker's specimens have put it in my power to accomplish.

The exudation on the bark of this species is even more different in appearance from true Gamboge than that of the *Garcinia cambogia*. It forms small tears of a pale grayish-green colour, sometimes also pale yellowish-green; and it is translucent like a resin. It does not form an emulsion at all when rubbed with the wet finger. It is pretty hard, and in cold weather pulverizable.

From the facility with which it softens when heated, it probably contains some volatile oil; but my specimen could not afford me enough for ascertaining that point with care. For the same reason I could not attempt an exact quantitative analysis of its other component parts. But it is evidently a true gum-resin—containing, however, less gum than that of the *Hebradendron*. Sulphuric ether removes a pale greenish-yellow resin, leaving an opaque glutinous mass, which is broken up and partially dissolved by cold water. The watery solution froths on agitation, and when evaporated leaves a viscous matter, evidently Arabin, or soluble gum. A small quantity of fibrous impurities and fleecy particles remains unattached by the ether and cold water. One grain and seven-tenths of the gum-resin yielded 1.3 of resin, 0.3 of gum, and 0.2 of fibre, that is, 76.5, 17.6, and 5.9 per cent. This result seems to indicate the absence of volatile oil; but it cannot be relied on absolutely, on account of the small scale of the analysis. The result, however, is sufficiently accurate to show, when taken along with the sensible qualities of the gum-resin, that the *Xanthochymus pictorius* does not yield an exudation resembling in any material property the true Gamboge of the *Hebradendron*.

There still remains a fourth Guttiferous plant, which has been supposed to yield a concrete juice similar to Gamboge, namely, the *Garcinia pictoria*. This I have not hitherto been able to obtain. Dr. Roxburgh mentions in his *Flora Indica*, that it seemed of a finer colour in its crude state than any other kind, but that the tint was not permanent.[3] I can scarcely anticipate any other conclusion, from a careful examination of its properties and composition, than that, like the two substances described above, it possesses the generic characters of a gum-resin, but is otherwise only remotely analogous to the true Gamboge of Ceylon and Siam.

[1] Suchas Roque, in his Phytographie Médicale, ii. 196. Paris, 1821.

[2] Illustrations, &c. p. 132. Part iv.—1834.

[3] Flora Indica, ii. 629.

BOTANICAL INFORMATION.

ALGÆ DANMONIENSES.

By a slip of the pen we announced the last volume of Mrs. Wyatt's *Algæ Danmonienses* as the third instead of the fourth. This, the fourth volume, completes this beautiful work: and, including as it does two hundred species, we cannot but congratulate the meritorious Collector on the great success that has attended her researches, confined as they have been almost entirely to one circumscribed spot on the British coast. For in no other portion assuredly, of such limited extent, do we believe it possible that so great a number of rare species could be obtained as have rewarded the exertions of Mrs. Wyatt in Torbay.

Vol. IV. contains the following species: —152. *Fucus vesiculosus.* 153. *F. ceranoides.* 154. *F. nodosus.* 155. *Lichina pygmæa.* 156. *Laminaria digitata.* 157. *L. fascia.* 158. *a. Desmarestia aculeata* (summer appearance). 158. *b. D. aculeata* (winter appearance). 159. *Chorda Filum.* 160. *Striaria attenuata.* 161. *Polyides rotundus.* 162. *Laurencia pinnatifida,* var. *angusta.* 163. *Porphyra linearis.* 164. *Ulva Linza.* 165. *Enteromorpha compressa.* 166. *Enteromorpha erecta.* 167. *Bangia fusco-purpurea.* 168. *Vaucheria marina.* 169. *Cladostephus spongiosus.* 170. *Sphacelaria filicina.* 171. *S. cirrhosa.* 172. *Ectocarpus siliculosus.* 173. *E. sphærophorus.* 174. *E. brachiatus.* 175. *Polysiphonia parasitica.* 176. *P. violacea.* 177. *P. fastigiata.* 178. *P. subulifera,* Ag. (new to Britain). 179. *Dasya ocellata* (very rare) 180. *Ceramium ciliatum.* 181. *Griffithsia equisetifolia.* 182. *Calithamnion cruciatum* (very rare). 183. *C. Turneri.* 184. *C. Brodiæi* (rare). 185. *C. byssoides* (extremely rare). 186. *C. tripinnatum* (extremely rare). 187. *C. seminudum* (very rare). 188. *C. Rothii.* 189. *C. virgatulum* (rare). 190. *Conferva tortuosa.* 191. *C. ærea.* 192. *C. fucicola.* 193. *C. pellucida.* 194. *C. lanosa.* 195. *C. glaucescens.* Harv. MSS. 196. *Lyngbya speciosa* (rare). 197. *Mesogloia? moniliformis.* Griff. MSS. (a new species, and probably a new genus, parasitic on *Sphacelaria spongiosa.* Salcombe Bay). *Schizonema helminthosum.* 199. *S. Dillwynii* (rare). 200. *S. Grevillii* (rare.) 201. *S. parasiticum.* Griff. MSS. (new species?). The work is concluded by an Index, in which all the species are systematically arranged according to the 2nd vol. of Hooker's British Flora.

The first and second Decades of the 2nd volume of the "*Nova Genera ac Species Plantarum quas in Regno Chilensi Peruviano et in terra Amazonica annis* 1827 *ad* 1832 *legit Edwardus Pœppig et cum Stephano Endlicher descripsit Iconibusque illustravit*" have just been sent us by Dr. Pœppig, and we cannot too strongly recommend the work to those who feel an interest in the magnificent Flora of those fertile regions. The whole of the twenty plates which now appear are devoted to Orchideous plants, which, together with those that have been given in the previous Fasciculi, make the number of *Orchideæ* (almost entirely new) already published by Drs. Pœppig and Endlicher, amount to seventy-five.

A constant supply of interesting matter from our friends, for this Journal, has induced us to postpone the notice of one of our own publications, to which, nevertheless, we are anxious to direct the attention of our botanical friends; we mean the "*Icones Plantarum Rariorum,*" of which the first part, in 8vo., containing fifty plates, and as many leaves devoted to description, appeared about three months ago, and a second similar part has just now (Feb. 1.) been issued. Its object is to give accurate figures in lithography of some of the many new and interesting plants which, by the exertions of Naturalists in almost every part of the world are daily pouring in upon us, and enriching our Herbaria; and these in so cheap a form that they come within the reach of all who are concerned in the progress of this delightful branch of science. The liberality of the Publishers, Messrs. Longman and Rees, has secured

the Author from any positive pecuniary loss upon *two* volumes, each of one hundred plates, to which extent he has pledged himself to go: and should the sale be only such as to cover the expenses, it will be a source of real pleasure to the author to supply the materials for its continuation. The first part, the only one now before us, contains the following plants:—

BRIDGESIANÆ; from Chili. *Anemone hepaticifolia*, Hook. tab. 1. *Aextoxicum punctatum*, R. P. tab. 13. *Desfontainia spinosa*, R. P. tab. 33.

GUNNIANÆ; from Van Diemen's Land. *Corræa Backhousiana*, Hook. tab. 2. *C. ferruginea*, Backh. tab. 3.

TWEEDIANÆ; from S. Brazil. *Ophioglossum palmatum*, Plum. tab. 4.

WALKERIANÆ; from Ceylon. *Gyrinops Walla*, Gærtn. tab. 5. *Samadera Indica*, Gærtn. tab. 7.

WALLICHIANÆ; from the East Indies. *Aquilaria Agallocha*, Roxb. (Aloes or Eagle-wood), tab. 6. Fifty-five species of Mosses represented on eight plates, tab. 17—24.

CARMICHAELIANÆ et ROBERTSIANÆ; New Zealand. *Todea pellucida*, Hook. et Grev. tab. 8. *Sphæria Robertsii*, Hook. tab. 11.

DARWINIANÆ et REYNOLDSIANÆ; from S. Chili and Antarctic America. *Pernettia pumila*, Hook. tab. 9. *Viola Cotyledon*, Ging. tab. 13. *Ledocarpon Reynoldsii*, Hook. tab. 14. *Donatia Magellanica*, Lam. tab. 16. *Polytrichum dendroides*, Hedw. tab. 25. *Prionotes Americana*, Hook. tab. 30.

LYALLIANÆ et BOJERIANÆ; from Madagascar. *Clematis Bojeri*, Hook. tab. 10.

VACHELLIANÆ; from China. *Osmunda Vachellii*, Hook. tab. 15.

MATHEWSIANÆ; from Peru. *Lycopodium Mathewsii*, Hook. tab. 26. *Cremolobus rhomboideus*, Hook. tab. 32. *C. Peruvianus*, D C. tab. 48.

ANDRIEUXIANÆ; from Mexico. *Arbutus Xalapensis*, H. B. K. tab. 27. *Arbutus discolor*, Hook. tab. 29.

DRUMMONDIANÆ; from Texas and the southern States of N. America. *Cleomella Mexicana*, D C. tab. 28. *Draba dentata*, Hook. et Arn. tab. 34.

JAMESONIANÆ; from Columbia, chiefly the Cordillera. *Bryum pulchellum*, Hook. tab. 34. *Draba violacea*, D C. tab. 35. *Lycopodium rufum*, Hook. tab. 36. *Rubus rosæflorus*, Hook. tab. 46. *Pleurothallis cauliflorus*, Hook. tab. 50.

DOUGLASIANÆ; from California. *Dendromecon rigidum*, Benth. tab. 37. *Platystigma lineare*, Benth. tab. 38. *Thysanocarpus elegans*, Fisch. et Mey. β. tab. 39. *T. pusillus*, Hook. tab. 42. *Streptanthus glandulosus*, Hook. tab. 40. *S. flavescens*, Hook. tab. 44. *Lepidium latipes*, Hook. tab. 41. *Tropidocarpum gracile*, Hook. tab. 43. *Viola chrysantha*, Hook. tab. 49.

CUNNINGHAMIANÆ et FRASERIANÆ; from New Holland. *Leucolæna peltigera*, Hook. tab. 45. *Cheiranthera linearis*, All. Cunn. tab. 47.

It was omitted in the first Part, but in Part Two, and the succeeding ones, the pages will be found headed by the name of the Botanist to whom the author is indebted for the species there described (as *Mathewsianæ, Douglasianæ*, &c.), and also with the name of the Natural Order. The price of each part is 15s.; and the second Part, now published, the contents of which we shall shortly give a brief account, completes the first volume.

Mr. R. Ball of Mountjoy Square, Dublin, has obligingly communicated the intelligence of *Erica vagans* having been ascertained to be a native of Ireland, in a letter of which the following is an extract, dated Dec. 30th, 1836.

"My friend, Dr. Burkett of Waterford, sent me, with a parcel of native plants, gathered by himself last summer, a specimen of *Erica vagans*, which I find he discovered on an islet on the coast of Waterford, near Tramore." This makes Ireland equally rich with England in the number of species of this beautiful genus; though each still boasts of one which the other does not possess—Ireland of *Erica Mediterranea*, England of *E. ciliaris*.

RECENT INFORMATION ON THE SUBJECT OF THE UNIO ITINERARIA.

"We beg to announce to those Botanists who are interested in the success of the Unio-Itineraria, and who have contributed the sum of £6 for shares of Arabian and Egyptian plants, that they have received, on an average, about four hundred species, collected partly in Lower Egypt, and partly in Arabia Petræa. Any subscriber, whose number falls short of that amount, will be supplied according to this announcement; while each individual may, besides, have a supplementary share of about one hundred species, mostly consisting of such plants as have been gathered in Arabia Felix, and the distribution of which will take place in the spring of this immediately ensuing year (1837). Although the four hundred species, already sent out, contain much of rarity and interest, and even of novelty, viz. two new genera (No. 402, labelled as a *Bromus*, and No. 244, *Schimpera*), yet the supplemental century, mentioned above, will include, proportionally, still scarcer plants, by which the satisfaction of the subscribers, already most pleasingly stated by some, cannot fail to be increased. The welcome arrival of these latter plants took place a few weeks ago; they were collected by our traveller, at Hedshas, near Djedda, and in the environs of Mecca, during the interval from Nov. 1835 to Feb. 1836, and amount to more than two hundred species, to which will be added some Egyptian ones, (a few only, and of the scarcer kinds,) gathered in the course of last summer in Upper Egypt, where the collector occupied himself chiefly with Zoology, and during the latter part of autumn in Lower Egypt. Thus the subscribers may obtain upwards of one hundred species as a supplement, if they so desire it, by making an addition to the amount of their former subscription, a stipulation which becomes necessary in order to cover the charges of the very expensive journeys which our traveller performed for nearly three years. Those individuals, therefore who, besides the hundred supplementary species, may wish to receive an additional century, consisting of the rarer productions of Arabia Felix, will have to pay £1 10s., besides their former contribution, a price which cannot be considered high for plants from those distant regions; and should it prove possible to add some of the new Egyptian specimens which we daily expect to receive, the distribution will exceed that number.[1]

"Our principal object, at present, being to promote the further plans and intentions of this Institution, we beg to state, that our traveller has already set out for Abyssinia from Cairo, in company with one of the Missionaries, a native of Stuttgard. At our own risk we have furnished him with a sum of about £100, which will not, however, prove sufficient, if, according to our earnest wish, he remains more than a year in that country. We therefore request our fellow-members and every well-wisher to Botany, to place us, by their subscriptions, in a situation that may enable us, not only to cover our expenses, but to render still further aid to our traveller. The amount of subscription for the Abyssinian expedition, is accordingly fixed in the same manner as the former Arabian one, viz. £3 for single, and £6 for double shares, to be paid previously to the individuals' names being entered as *bona fide* share-holders. This expedition will probably prove of still greater interest than that to Arabia, which was, however, accompanied by a rich produce.

After this, we recommend the collections made by M. Hohenacker in Georgian Caucasus, on the confines of Persia, of which the fourth supply reached us a few months ago, containing very scarce, and many new species, and which are offered at the subscription price of £2 10s. for two hundred species, and £1 10s. for one hundred and twenty species.

"Besides these, there remain for those individuals, who have not participated in the third supply from the same quarter, about sixty species, at the price of 16s.

[1] About two hundred and fifty sorts of seeds of plants from Arabia Felix, the prices of which have not yet been fixed, may, if desired, be also obtained.

"The North American specimens, chiefly from the State of Ohio, for which we have received, and are still receiving, 22s. per hundred, can only be distributed in the spring of 1837, together with those from Arabia.

The specimens, collected in New Holland by M. Gotsky, have been taken for sale by the *Unio Itineraria*, and will be distributed in the course of next summer. They are chiefly from the neighbourhood of Port Jackson and Botany Bay; the greater part corresponding with those gathered by the late M. Sieber. To such individuals as may not be in possession of this Botanist's plants, they are the more interesting, as the specimens are very fine and perfect, particularly in the families of *Epacrideæ, Leguminosæ, Myrtaceæ*, and *Proteaceæ;* the price to be £2 per hundred. As there are no more than thirty shares, from one hundred, two hundred, and three hundred per share—the subscribers must make an early application.

"Finally, we beg to explain to such of the members as may regard the subscription prices as higher than those of earlier years, that these expeditions have since been conducted on a larger scale; travels of such extent requiring not only a much larger outlay, but also increasing the cost of freight, land-carriage, and postage: these charges, together with printing, amounting to considerable sums, and swallowing up all the profit derived from the greater subscription. We do not ourselves demand any thing for the trouble and expense of package, requisite for transmitting their shares to the respective members; and any small surplus that may remain is either given, as a well-earned gratuity to the collector, or carried over for the promotion of future undertakings. We therefore confidently hope for the future support, not only of present share-holders, but of those individuals who take an interest in this subject."

HOCHSTETTER & STEUDEL.
Esslingen, Dec. 26, 1836.

We trust that this appeal to the Botanists of Europe will be duly responded to; and that every one anxious to add to the value of his Herbarium, will embrace the opportunity of possessing the plants from the highly interesting countries above mentioned. For our own parts, we cannot but feel grateful to this Society, which has so liberally exerted itself for the promotion of Botanical Science: and as we have been subscribers from the commencement of this Institution to the present day, we feel ourselves authorised and justified in saying, that no collections were ever offered for public sale having such claims to our attention both from the beauty and rarity of the specimens, as those of the UNIO ITINERARIA. ED.

ILLUSTRATIONS OF INDIAN BOTANY; PRINCIPALLY OF THE SOUTHERN PARTS OF THE PENINSULA.

By Dr. Wight and G. A. W. Arnott, Esq.

(Continued from page 193.)

CICENDIA HYSSOPIFOLIA.

TAB. XXVIII.

GEN. CHAR. CICENDIA. *Adans. Griesb.* *Corolla* infundibuliformis, corona 0, eglandulosa, demum supra capsulam torta, tubo brevi. *Stigma* indivisum stylo impositum. *Capsula* 1-locularis, hinc valvulis introflexis semibilocularis. *Antheræ* immutatæ. *Griesb.*

Dr. Griesbach observes that there are three sections in this genus;—1. with the capsule one-celled, the inflorescence terminal, and the parts of the flower quaternary (*Cicendia filiformis*, Rchb.); 2. with the capsule half two-celled, the inflorescence terminal, the parts of the flower quaternary (*Hippocentaurea*, Rchb.); 3. with the capsule one-celled, the flowers in axillary glomeruli, the parts of the flower quinary (*Hippion*. Spr. *Slevogtia*, Rchb.). It will be at once seen that our plant belongs to his third section.

Cicendia *hyssopifolia;* foliis lineari-lanceolatis trinerviis, florum glomerulis axillaribus pseudo-verticillatis.

Gentiana hyssopifolia. *Linn. Suppl. p.* 174. *Vahl's Synb.* 3. *p.* 47. *Burm. Afr. t.* 74. *f.* 3.

Hippion hyssopifolium. *Spr. Syst. Veget.* *v.* 1. *p.* 589.

Exacum hyssopifolium. *Willd. Sp. Pl.* *v.* 1. *p.* 640. *Roem. et Schult. Syst. Veget. v.* 3. *p.* 160.

Annual. *Stems* herbaceous, four-sided, glabrous, the angles slightly winged: *branches* few, opposite, diffuse. *Leaves* opposite, decussate, linear-lanceolate, tapering at the base, and embracing the stem with the short petioles, smooth, three-nerved, much paler below. *Flowers* six or eight together, in axillary *whorls*, sessile, white, each furnished with a linear spathulate *bractea*. *Calyx* five-cleft, divisions acute, margined, reflexed at the point, permanent, and closely embracing the base of the mature capsule. *Corolla* tubular, five-cleft; divisions obtuse, spreading, oblique at the base. After withering, the corolla remains, closely investing the capsule until it bursts. *Stamens* five; *filaments* attached to the middle of the tube, and furnished at the base with a small projection which rests on the stigma, and closes the tube. *Anthers* linear-oblong, erect, subsagittate, two-celled. *Pistil*: *Germen* superior; *Style* short; *Stigma* capitate. *Pericarp*: *Capsule* two-valved, one-celled, the margins inflexed, and bearing the numerous, small, round, brownish *seeds*.

This is a common plant, found in a variety of situations. In rich moist soil it grows to the height of from twelve to fifteen inches, and then every part is large in propertion; while, in poor sandy soils, it does not exceed two or three inches. The whole of the plant is somewhat bitter, though much less so than many of its natural allies. Like them it is employed by the natives of this country as a stomachic, and is administered in decoction or powder. Thus used it is also said to act as a laxative, an effect attributed to its *tonic* properties: one of the best pathological observations we ever heard from a native.

Fig. 1. Flower with the Corolla laid open. 2. Capsule. 3. Section of ditto;—*more or less magnified.*

CONTRIBUTIONS TOWARDS A FLORA OF SOUTH AMERICA AND THE ISLANDS OF THE PACIFIC.

By Sir W. J. Hooker, LL.D., and G. A. W. Arnott, Esq., A.M. F.R.S.E.

I. EXTRA-TROPICAL SOUTH AMERICA.

(*Continued from p. 52 of the present volume.*)

Before proceeding to the *Baccharideæ* among the *Compositæ*, (the sub-tribe which follows next upon the *Astereæ*, described in our last memoir on South American Botany) we think it but due to our readers to offer some observations upon those *Compositæ* we have already published, especially with reference to the first part of the fifth volume of De Candolle's Prodromus, in which inestimable work, as, from the date of its publication, was to be expected, many of our species have appeared under names different from those given by us.

731. Mycroseris *pygmæa*, Don.—To the synonyms we have already given must be added *Fichtea* of Schultz, in Linnæa, v. 10. p. 255; but the pappus certainly does not consist of scales independent of bristles; for each bristle is dilated on both sides at the base into a scale, of which, in fact, the bristle forms the midrib.

739. Macrorhynchus *Chilensis*, Less.—To this plant belongs *M. pterocarpus*, Fisch. et Mey. in Ann. des Sc. Nat. 5. p. 295: and we fear that the *M. lævigatus* of the same authors may prove not to be a distinct species.

870. Vernonia *ericæfolia*, Hook. et Arn. —To our definition may be added, "ramis floriferis ante apicem nudis monocephalis, pappi serie exteriori paleaceo brevi, acheniis turbinatis sericeo-villosis." The plant belongs to De Candolle's section *Leptospermoides*, from all the species of which it is readily distinguished by its narrow leaves.

875.* Vernonia *squamulosa*, Hook. et Arn.—The var. γ. *leiolepis* of *V. psilophylla*, D C. p. 28, seems to belong to this; but we consider it a distinct and well-marked species.

891. Elephantopus *Carolinianus*, Willd. —Our plant agrees with the *E. Martii*, D C., p. 28.

892. Alomia *spilanthoides*, Don.—To this belongs *Gymnocoronis attenuata*,

D C., p. 106; but we do not find any difference between this new genus of Professor De Candolle and *Alomia*, except that the former has a simple, the latter an imbricated involucre.

893. Stevia *lanceolata*, Hook. et Arn.—This name may be changed to *S. Gilliesii*, since there is already an *S. lanceolata*, described by Lagasca.

895. Stevia *laxa*, Hook. et Arn.—In this the leaves are occasionally serrated, sometimes they are scabrous, sometimes nearly glabrous, so that it is probable that both *S. linariæfolia* and *S. megapotamica*, D C. p. 123, may belong to our species.

896. Stevia *aristata*, Don.—*S. Veronicæ*, D C., p. 123, appears to be a mere form of this.

898. Stevia *gratioloides*, Hook. et Arn. —The pappus consists of fifteen or sixteen bristles.

900. Stevia *hirsuta*, Hook. et Arn.—Has about twenty bristles to the pappus.

903. Eupatorium *squarrulosum*, Hook. et Arn.—There are about twenty-five florets in each capitulum, and the species is evidently closely allied to *E. liatrideum*, D C., p. 142; but the leaves of the latter are much narrower.

906. Eupatorium *congestum*, Hook. et Arn.—*E. tozziæfolium*, D C., p. 146, is probably the same. The only difference seems to be that in our plant the achenia are furnished with a few scattered bristles; in *E. tozziæfolium* they are said to be somewhat villous at the angles.

907. Eupatorium *subhastatum*, Hook. et Arn.—*E. bartsiæfolium*, D C., p. 147, may be adduced as a synonym.

908. Eupatorium *concinnum*, Hook. et Arn.—There are about twenty florets in the capitulum; in other respects it is closely allied to *E. trichophorum*, D C., p. 147.

910. Eupatorium *ellipticum*, Hook. et Arn.—The capitulum has about eight flowers; hence the species is allied to *E. hexanthum*, D C., p. 148.

913. Eupatorium *pedunculosum*, Hook. et Arn.—This has from twenty to twenty-five florets in each capitulum, and approaches *E. conyzoides*, D C., p. 143.

914. Eupatorium *lætevirens*, Hook. et Arn.—Belongs to De Candolle's second series, of which the species have about eighteen florets in each capitulum, but from all the enumerated ones this is readily distinguished by the narrow, glabrous leaves.

915. Eupatorium *paradoxum*, Hook. et Arn.—This is *Nothites baccharidea*, D C., p. 187.

916. Eupatorium *buniifolium*, Hook. et Arn.—The *E. anethifolium*, D C., p. 182, is probably nearly allied to this, but it comes from a totally different country.

917. Eupatorium *ceratophyllum*, Hook. et Arn.—Probably *E. multifidum*, D C., p. 182, is the same species.

918. Eupatorium *decipiens*, Hook. et Arn.—To this may be referred *E. foliolosum*, D C., p. 174.

918.* Eupatorium *dodoneæfolium*, Hook. et Arn.—A subsequent examination of this plant induces us to consider it rather a species of *Conyza*, near *C. arguta*, D C., p. 377, from which it differs in the leaves being attenuated into a distinct petiole, dotted on the underside, and by the capitula being sessile, and several placed together at the extremity of the branches of the corymb. There are two sterile florets in the centre of each capitulum, surrounded by many filiform ones; the former contain each an abortive style and imperfect anthers.

919. Eupatorium *virgatum*, Don.—*E. pinnatifidum*, D C. p. 149, is one of the forms of this species.

920. Eupatorium *tremulum*, Hook. et Arn.—To our var. *β.* belongs *E. polystachyon*, *β. angustius*, D C., p. 149. Our var. *α.* may be a still narrower and longer-leaved form; but in some points it accords so well with *E. xylophylloides*, D C., that we are almost disposed to consider it as the same. That species, however, is described as having a corymbose inflorescence, with opposite branches, while in our plant it is a panicle, with alternate racemose ramuli.

921. Eupatorium *fulvum*, Hook. et Arn. —There are only four florets in the capitulum and four scales to the involucre, so that it belongs to *Mikania*, according to De Candolle. The pedicels are filiform and as long as the capitula, and are no where furnished with a bracteole.

922. Eupatorium *elongatum*, Hook. et Arn.—There are about seven flowers in the capitulum, and the achenium is angled and sparingly strigose. It approaches *E. pyrifolium*, D C., p. 153.

923. Eupatorium *Nummularia*, Hook. et Arn.—The capitulum contains five florets, and the inner scales of the involucre are five, oblong and obtuse; a second series is formed by ovate scales, about half the length of the inner ones; the outer series consists of two linear or almost subulate scales, longer than those of the intermediate series. It has

the involucre and corolla of *Eupatorium*, and, perhaps, ought to be arranged in De Candolle's second series of "*Subimbricata*;" but there seems to be no allied species there. Its nearest natural affinity appears to be with *Mikania sessilifolia*, *M. leiolæna*, and *M. Nummularia*, of De Candolle. In our specific character, where the leaves are characterized, the word "*dentatis*" should be substituted for "*elevatis*," an error of the press.

925. Eupatorium *reticulatum*, Hook. et Arn. (non Desv., fide D C.)—This is *E. Salvia*, Colla and D C., p. 157, a name which, consequently, ought to be retained.

927. Eupatorium *Paranense*, Hook. et Arn.—To this belongs *E. pallescens* β. D C., p. 154.

928. Eupatorium *pallidum*, Hook. et Arn.—This does not seem to be taken up by De Candolle, unless it is united by him to the preceding; but there are always eleven or twelve florets in the capitulum; the scales of the involucre are pubescent, the inner ones very much so, or almost villous at the apex; the leaves are much broader in comparison with their length; but in both the achenia are glabrous.

929. Eupatorium ? *patens*, Don.—There are only four florets in the capitulum, as in *Mikania*, but the involucre and corolla are those of *Eupatorium*; the scales of the former are about eight or nine in number and unequal, but are loosely imbricated, as in the series "*Subimbricata*;" though to none of that series does it seem to bear any affinity.

930. Eupatorium *Tweedieanum*, Hook. et Arn.—The *E. steviæfolium*, D C., p. 158, approaches very closely to this.

931. Eupatorium *ligulæfolium*, Hook. et Arn.—The *E. gnidioides* of D C., p. 150, does not seem to differ from this; but judging from De Candolle's description, as well as from the examination of our specimens, it ought to be placed in the series "*Subimbricata*," for the scales of the involucre are loosely imbricated, in at most three rows, and not at all striated.

933. Eupatorium ? *calyculatum*, Hook. et Arn.—This plant Professor De Candolle considers a *Stevia*, and it is his *S. calycina*, p. 124.

934. Eupatorium *lanigerum*, Hook. et Arn.—The leaves are, in reality, opposite and not alternate, as stated in our description. To our var. β. belongs *E. Paulinum*, D C., p. 158, which we believe to be only a narrower leaved var. of our *E. lanigerum*.

936. Eupatorium *tanacetifolium*, Hook. et Arn.—To this must be referred *E. Bacleanum*, D C., p. 157.

937. Eupatorium *scandens*, Hook. et Arn. (non Link, nec Linn.)—De Candolle's *Mikania biformis*, p. 202, is the same.

938. Eupatorium *populifolium*, Hook. et Arn.—Here should be brought *Hebeclinium urolepis*, D C., p. 136.

939. Eupatorium *Candolleanum*, Hook. et Arn.—This plant belongs to the genus *Conoclinium*, D C., and his *C. betonicæfolium* represents one of the many forms of our species. Sometimes the leaves are villous, sometimes scabrous beneath, and sometimes scabrous only on the nerves.

941. Eupatorium *sulcatum*, Hook. et Arn. belongs to *Mikania*, as defined by De Candolle, and is allied to that author's *M. pentstemoides*, if, indeed, it be not a mere glabrous form of it. Like it the bracteole is small and acute, and the whole inflorescence is pubescent. The capitulum contains five flowers, and there are five scales to the involucre, as in several undoubted species of *Mikania*.

942. Eupatorium *Donianum*, Hook. et Arn., is, unquestionably, the *Campuloclinium macrocephalum*, D C., p. 137.

943. Eupatorium *rufidulum*, Hook. et Arn., is a new species of the genus *Hebeclinium*, D C. The inner scales of the involucre have a short, glabrous, reddish-coloured, membranous appendage.

944. Mikania *sericea*, Hook. et Arn.—The clothing of the leaves should have been thus expressed; "foliis supra hispidis, subtus densissime strigoso-sericeis." Perhaps *M. erioclada*, D C., p. 192, may be the same; but the description of its leaves is incomplete. The bracteole, however, in our species is ovate, and situated at the apex, not at the base of the pedicel, in which respect it agrees with the *M. Banisteriæ*, but that has broader leaves and a prominent reticulation on their upper surface. In *M. sericea* the hairs on the leaf spring from minute white tubercles, which are very conspicuous on the upper side. The stem and petioles are as in *M. erioclada*. The scales of the involucre are linear-oblong and pubescent.

946. Mikania *scandens*, Willd.—Among our specimens are some with hastate

leaves, which probably constitute the *M. diversifolia* of D C., p. 201.

949. Mikania *involucrata*, Hook. et Arn. —*M. bracteosa*, D C., p. 194, is the same.

952. Mikania ? *trinervis*, Hook. et Arn. —*M. lævis*, D C., p. 194, may be considered a synonym to this.

980. Grindelia *diffusa*, Gill.—From a recent comparison of our plant with Dunal's figure of *G. pulchella* (also a native of Mendoza), we have no doubt of their identity. Dunal represents the scales of the involucre as patulous, or recurved at the extremity, and we therefore presume that it is by inadvertence De Candolle describes them as appressed: and further, he attributes only three bristles to the pappus. It is certainly extremely difficult to determine the exact number on account of their very fugacious character, but we feel sure that there are sometimes as many as eight or ten.

981. Grindelia *discoidea*, Hook. et Arn. —De Candolle's *G. anomala*, p. 316, is the same with our plant.

985. Solidago *odora*, Willd. — Of this there is a fourth var., which may be defined "δ. *scabra;* acheniis glabris." We determined our specimens from Lessing's observations in the Linnæa; but De Candolle restricts the name to the North American form. Our var. γ. is his *S. marginella*, p. 332. Our β. and δ. are probably his *S. microglossa*. The state of our plants with spreading racemes seems to belong to his *S. polyglossa*, and those from Buenos Ayres, with a contracted racemose panicle, to *S. linearifolia*, α., p. 341, found by Nees in the Pampas of Buenos Ayres (not Chili); while our Chilian specimens, or *S. Chilense*, Kunze, are *S. linearifolia*, β. *Pöppigii*. We are still of opinion that all these Chilian and South Brazilian individuals form but one species. In all their forms the racemes, which compose the panicle, are secund.

986. Diplopappus *foliosus*, Hook. et Arn. —This is *Aplopappus foliosus*, D C., p. 346. Nearly all the other species which we have described belong likewise to *Aplopappus*, as defined by De Candolle.

987. Diplopappus *mucronatus*, Hook. et Arn.—De Candolle seems only to know this plant from our description in the Botany of Beechey's Voyage. It is his *Baccharis Hookeriana*, p. 414; but it properly belongs to his *Aplopappus*.

988. For "Diplopappus *foliosus*" in this place, read "*D. ilicifolius*," Hook. et Arn.

990. Diplopappus *inuloides*, Hook. et Arn.—To this is to be referred *Aplopappus Berterii*, β. *lanceolatus*, D C., p. 348.

991. Diplopappus *grindelioides*, Less.—*Aplopappus Berterii*, α. is probably identical with this; but it is a very distinct species from the preceding. It has glabrous peduncles, or floriferous branches, and, therefore, cannot be *Aplopappus grindelioides*, D C.

992. Diplopappus *cuneatus*, Hook. et Arn.—We believe *Aplopappus scrobiculatus*, D C., p. 348, to be the same with this plant, but the scales of the involucre are not truly scrobiculate. They present elevations and depressions, owing to the undulated surface.

993. Diplopappus *bellidifolius*, Hook. et Arn., is probably *Aplopappus glutinosus*, D C., p. 347, but the leaves do not agree well with Lessing's description of that plant.

995. Diplopappus *coronopifolius*, Less., is perhaps a different species from the *Aplopappus coronopifolius*, D C., in which the pappus is reddish, and the scales of the involucre are serrulato-ciliated; but most of the other characters sufficiently accord.

1001. Diplopappus *glutinosus*, Poep., seems a distinct species from the *Aplopappus glutinosus*, D C., p. 347.

1003. Diplopappus *sericeus*, Less., var. α., as regards the Chilian specimens from Cuming and Bridges, is *Aplopappus? sericeus*, D C. p. 349. Those from Buenos Ayres and the East side of the Cordillera appear to constitute the *Aplopappus acuminatus*, D C., p. 349; but the difference assigned between the two species is not constant. Dr. Gillies' Chilian specimens from Peral, (*Aplop. lividus*, Gill.,) are the *Noticastrum adscendens*, D C., p. 279: while Bridges, n. 299, and Gillies' specimens from Curico, Valparaiso and Casa blanca, belong also to *Noticastrum*, and only differ from the type of *N. adscendens* by being more woolly, and having smaller flowers.—This new genus of Professor De Candolle, however, is only distinguishable from *Aplopappus* by the ray being of a reddish colour, and longer than the disk; and we are still inclined to think, that all may be considered as variations of one and the same species.

1004. Diplopappus *diffusus*, Hook. et Arn. (*Erigeron diffusus*, Pers.) is *Aplopappus diffusus*, D C., p. 325.

1006. Diplopappus *hispidus*, Gill., is *Neja linearifolia*, D C., p. 325.

1007. Diplopappus *villosus*, Hook. et Arn.

appears to be *Neja subvillosa*, D C., p. 326.—We may here observe that *Erigeron filiformis*, Spr., seems to be *Neja tenuifolia*, D C., and *E. Montevidensis* of the same author another species of that genus.

1011. Aster *erigeroides*, β. Hook. et Arn., is *Erigeron fruticosum*, D C., p. 283; but we are still disposed to view it as a luxuriant form of our α. The habit is that of *Erigeron*, but the characters belong rather to *Aster*.

1012. Aster *subulatus*, Mich.—The Chilian specimens, particularly those of Bridges, n. 183, are the *Tripolium conspicuum*, Lind. in D C., p. 254: those from the East coast, *Tripolium subulatum*, var. *Brasilianum*, D C.; but we cannot see how they are to be separated, while there are so many intermediate forms.

1014. Aster *Gilliesii*, Hook. et Arn.—*Aster Gayanus*, D C., p. 227, is probably the same.

1015.* Sommerfeldtia *spinulosa*.—By mistake *Mycrogyne trifurcata* is printed so as to appear a synonym to *Sommerfeldtia*. It ought to commence a fresh line, and to be headed by a new number.

1016. Erigeron *Canadensis*, L.—Although we are rather of opinion, that we are correct in thus naming our specimens, we may observe, that the leaves are ciliated as in the type of that species, agreeing also precisely with those of *E. spiculosus*; the panicle is narrow and elongated as in *E. strictus*, D C. (not H. and A.); and the capitula are similar in every respect to the true *E. Canadensis*. It partakes thus, more or less, of the character of *strictus*, D C., *E. spiculosus*, H. and A., and *E. Canadensis*. If it be desirable to constitute a new species of it, the name *E. sordidus*, Gill., should be retained: and it may be thus distinguished:—caule herbaceo erecto hispido, foliis linearibus glabris secus nervum subtus et margines setulis brevibus cartilagineis rigidulis incurvis scabris, panicula elongata contracta, involucri squamis linearibus discum æquantibus, ligulis disco æqualibus, receptaculo alveolato.

1017. Erigeron *spiculosus*, Hook. et Arn.—Of this Cuming's n. 159, and Bridges' n. 504, seem referable to *E. hirtellum*, D C., p. 290, so far as can be judged from the character. It was an indifferent specimen of this which we had thought might be the *Conyza ambigua* (Bot. of Beechey's Voy.). Cuming's n. 407 is probably *E. Berterianum*, D C., p. 286. Our other specimen corresponds with the *E. spiculosum* of D C.

1018. Erigeron *stenophyllus*, α. Hook. et Arn., is *Conyza linearis*, D C., p. 378, whilst our β. may be viewed as a form of *E. Berterianum* above quoted.

1019. Erigeron *strictus*, Hook. et Arn., is probably the *Conyza diversifolia*, Weinm. and D C., p. 378, but the difference between many species of *Erigeron* and *Conyza* is so slight as to be with difficulty detected. We have considered those species furnished with ligulate florets, however minute, as belonging to *Erigeron*; nad those with entirely filiform florets to *Conyza*.

1021. Erigeron *cinereus*, var. α., is *E. Pœppigii*, D C., p. 287. Our β. is, perhaps, *E. Andicola*, α. D C., p. 287, though there are some slight points of difference.

1022. Erigeron *uniflorus*, Linn. (β. nobis) is *E. Andicola*, D C.

1029. Gutierrezia *linearifolia*, Lag., D C. p. 653.—This is also *Brachyris paniculata*, D C., p. 313, and *Galinsogea resinosa*, D C., p. 677. Nor does *Brachyris Neæana*, D C., p. 313, appear to be sufficiently distinct, having, probably, been described from small specimens, corresponding with our var. γ., which has broader leaves than the other varieties, and a broader capitulum, and usually a greater number of ligulate florets. We had already noticed the affinity of *Brachyris* with *Gutierrezia*, and, perhaps, they ought to be united.

1034. Kleinia *Porophyllum*, Willd., is *Porophyllum ellipticum*, D C., p. 648.

1036. Kleinia *linifolia*, Gill. et Don., is *Porophyllum lineare*, D C. p. 349.

1038. Kleinia *pumila*, Hook. et Arn., is *Porophyllum linifolium*, D C.—Our other species do not appear to be known to De Candolle.

(To be continued.)

A DESCRIPTION OF SPARTINA ALTERNIFLORA OF LOISELEUR, A NEW BRITISH SPECIES;

With observations upon that, and Spartina stricta of English Authors.

By William Arnold Bromfield, M.D.

Having been engaged during last summer, in the intervals of frequent absence, with collecting the rarer plants of Southampton and its vicinity, I was desirous of

procuring and examining for the first time, specimens of *Spartina stricta,* which on the authority of Botanists' Guide, and other more recent publications,[1] as well as from private information, I was led to expect on the banks of the Southampton Water.

On the spot indicated to me by letter, namely, near the Itchen Ferry, I found no traces of this grass,[2] and imagined the necessary alterations, then in progress for effecting a steam communication between the opposite shores, might have caused its extirpation, when a few days afterwards (August 8th), I discovered on the flat and muddy shore of the Itchen river, considerably above the Ferry, and especially about the Belvidere ship-yard,[3] within high water-mark, large patches, of a *Spartina* indeed, but one which struck me at the first view as differing materially from such figures and descriptions of *Sp. stricta* as I had at the time an opportunity of consulting; for with this last I was then unacquainted, either in the living or dried state. One of the most striking points of dissimilarity, and which (if the present species be regarded by any as a mere variety, or even permanent race of *Sp. stricta*) will render an alteration in the specific definition of this latter indispensable, is the multiplicity of its spikes, which from the normal amount of two, or more rarely three,[4] are here increased to four (the minimum), six, eight, ten, or even thirteen, in one close, coarctate panicle, or compound spike.

Nor was I less struck by the much greater size and height of the new plant, as compared with the ordinary *stricta,* which is always described as not exceeding ten, twelve, or twenty inches,[5] whereas the Southampton species rises to two feet and a half *commonly,* and not unfrequently to above a yard. This last is likewise remarkable for the stout reed-like habit of its very upright culms, only so slightly ascending at the base as to allow room sufficient for the growth of the young sucker, which is usually to be seen shooting up close to the parent stem. The culms much surpass an ordinary reed in thickness, and where there are no young progeny at their origin, mostly rise from the root in a perfectly vertical direction, without any deviation from the perpendicular in the upper part; whereas in all the specimens of *Sp. stricta* I have since seen and gathered, the stems are ascending, and are more or less bent in the form of a bow, throughout their entire length, the spike itself making a portion, in many cases, of the arc so described. Moreover, the leaves in *Spartina stricta* appear very rarely to equal, and never to exceed, the flower-spikes in length;[6] whereas my friend Mr. Babington justly observed to me, that the excessive length of the leaves in the Itchen river plant, which are never materially shorter than the spikes, and commonly overtop them several inches, is one of its most distinguishing characteristics, and which, in conjunction with the straw-like hue of its tall and very erect culms, gives to extensive masses of this grass the aspect of fields of half-ripe wheat; an appearance to which the ear-like aggregate of close-pressed spikes contributes not a little.

Another peculiarity in our new plant, is the absence of that toughness and rigidity ascribed (and I think greatly over-rated) to *Sp. stricta,* as it may be plucked with

[1] Amongst others, the valuable little work of Mr. H. C. Watson.

[2] The true *Sp. stricta* does not grow by the Ferry at all now: a small patch or two existing just below the old, and almost in the line of the new, steam-ferry over the Itchen, is our new species of *Spartina* only.

[3] Adjoining the Belvidere yard, a small steamer, for some reason or other unemployed, lies rotting in a complete field of our new *Spartina.*

[4] Smith says, *rarely three;* and Mr. Woodward remarks, that amongst many thousands of *Spartina stricta* which he examined on the Suffolk coast, he never observed more than two spikes, which is the full complement in the figures of English Botany, Knapp, Withering and Reichenbach; and the number constantly assigned by the above authors, as also by Ray, Linnæus, Mertens and Koch, Host, Trinius, &c., and proved to be the usual number in British specimens by reference to such, from various and distant localities, in the Herbariums of Smith, Banks, Buddle, &c. in the British Museum, and at the Linnæan Society. At Southampton, however, the three-spiked variety of *stricta* is not uncommon, though always much less frequent than that with two.

[5] Our Southampton *stricta* never exceeds a foot, and is often much under that height.

[6] Excepting in immature specimens, before the spikes have attained their full dimensions.

the greatest ease, breaking or snapping asunder without the necessity of twisting the stem, or using the least exertion of strength.[1] Every part of the Southampton plant exhaled a very fetid odour, common to it and *stricta*, resembling that of phosphuretted hydrogen, which it retains after desiccation, and communicates to the paper in which it is kept, however frequently shifted; a few specimens will sensibly infect a whole room to a person just entering from the fresh air, or an adjoining apartment.

There remains to be mentioned another and singular difference between this species and the ordinary *stricta;* which is the more deserving of remark, since it depends on a structural peculiarity, affording an admirable discriminating character. In *Sp. stricta* the lower portion of the culm is clothed with the remains of sheaths suddenly truncated at their upper end, like the stipules of a *Polygonum*, or as if abruptly broken off at a joint,[2] an appearance never observable in the Southampton larger species; the reason of which is, that in the latter, the leaves are *continuous* with the sheaths at their base, *not articulated* with them as in *Sp. stricta*, where a strong annular, often projecting line or fillet interrupts the continuity, disposing the leaf to separate readily from the top of the sheath when pulled or torn, exactly at the articulation, marking the limits of each. In consequence of the intimate connexion between the leaves and their sheaths, the former remain attached to the latter during the life of the plant in our new English species, thus contributing greatly towards its resemblance, when viewed in the mass, to the ordinary Cerealia.

The following is a general description of the Southampton *Spartina*, which I shall henceforth designate as *S. alterniflora*. The words in italics are those expressive of the differences between our *alterniflora* and the ordinary *Sp. stricta*.

DESCR. *Root* creeping extensively, with long, white, and very stout-jointed runners; very much more *branched* and *fibrous* than in *Sp. stricta*, especially at the crown.[3] *Culms* one or many from the same root; *very slightly ascending*, or *quite upright*, hollow, *reed-like*, rather *brittle* than *tough;* from *eighteen inches to two or three feet in height;* thicker than a swan-quill at the base; clothed for some distance upwards with the withered sheaths of earlier growth, which are surmounted by the also withering, but *persistent* leaves. *Colour* of the culms and sheaths a rich straw-yellow, with a tint of red; green when young, often purplish-brown or olive on the upper part of the stem; much clearer and brighter at all times than in *Sp. stricta*. *Leaves* a foot or more in length, six to ten lines in breadth; alternate, nearly erect, quite flat above, except for an inch or two at their involute extremity, very obtusely keeled beneath, finely striated, glabrous in every part, of a pale, slightly glaucous green, of a pleasanter and livelier tint than in *stricta;* the uppermost, and very often that immediately succeeding it below, *much longer than the flower-spikes*, more rarely equal with the latter, *never shorter*. *Sheaths* closely investing the culms below; *open to a considerable distance from their summits downward*, in which they differ from those of *S. stricta*, whose sheaths are closed nearly to their junction with the leaf. *No distinct articulation* of the leaf with its sheath, into which the former suddenly contracts *without tapering*, presenting a *broad square base* at the point of union, with an *auricle*-like *fold* on each side of the stem, which is therefore much *narrower than the leaf* at *its origin*.[4] The want of articulation

[1] It is possible the imputed toughness and rigidity of *Sp. stricta* may be influenced by soil; with us here, it is certainly not so remarkable for either quality as many sea-side plants of its order. In these respects, however, it exceeds the new species, which last acquires considerable toughness when dried for the Herbarium.

[2] Well represented in Knapp's figure, t. 63 (otherwise a miserable one), and in that of English Botany, Vol. VI. t. 380.

[3] The figures just referred to, correctly represent the comparatively simple root of *S. stricta*, contrasted with the same parts in *alterniflora*, densely matted with innumerable fibrillæ at the top.

[4] The peculiarly dilated form of the leaf-bases is best seen on the lowermost leaves. In very young or small plants, this portion of the leaf not unfrequently

seems to be a character of primary importance in distinguishing our *alterniflora* from the common British *stricta*. *Ligule*, as in *Sp. stricta*, not a line in length; a mere row of white ciliæ, sometimes membranous and laciniated. *Spikes* (*cristæ* of Trinius) *numerous*, from four or five to twelve or thirteen[1] (usually six to eight), very unequal, three or four inches long, mostly alternate, sometimes opposite; the lowermost one often concealed by the sheathing base of the upper leaf; all united into a close, lanceolate, laterally compressed, coarctate *panicle*, or rather *compound spike*, bearing much resemblance, thus conjoined, to an ear of corn. *Panicle*, or *compound spike*, *eight to ten inches long*, in full-sized individuals. Common *rachis* merely a continuation of the culm itself, from which it differs in being compressed and slightly flexuose, but which, as it ascends, becomes finally dichotomous, the two divisions forming a pair of terminal spikes, similar to those below them, often but not always of equal length. Not unfrequently the alternate arrangement is obvious throughout, the common rachis ending in a solitary spike. Both the common and partial *rachis* may be considered as perfectly glabrous; but a very few and extremely minute spines may occasionally be discovered by the lens scattered at very distant intervals. Extremity of each partial rachis greatly *produced beyond the ultimate floret*, into a long, *awn-like*, and somewhat *flexuose point*.[2] *Florets* alternate, or spirally arranged on each partial rachis; somewhat remote, half an inch in length, about one-fourth smaller than in *Sp. stricta*. *Calyx-glumes* very unequal, the smaller and outer one linear, almost filiform, considerably shorter (often one-half) than the inner, in which respect it deviates from *stricta*, where the relative length of the glumes does not differ more than about a third.[3] Larger *glume* broader in proportion to its length than in *stricta*, with about three very strongly-marked, and (in the ripe plant) prominent lateral nerves,—another very good and constant character, which my friend Mr. Borrer first remarked, and pointed out to me, two months ago, it being to that gentleman I first imparted my suspicions of the specific difference betwixt our present plant and the *stricta* of British and continental writers. In the latter, these nerves are nearly obsolete. Towards its apex, the larger glume is almost always emarginate,[4] and the point itself commonly crowded with a minute fascicle of white bristly hairs, a continuation obviously of the minute spines pointing upwards, that arm the glume along its outer edge or back. In *stricta* I have never found such beard or tuft, though the dorsal spines exist equally in that species as in our *alterniflora*, but the larger glume of whose longer and narrower florets is simply acuminate at its apex; at other times bifid or torn. There is no roughness or hairiness on any part of the calyx in our plant, except occasionally a little silky pubescence towards the lower extremity of the larger glume, scarcely appreciable; the whole upper surface is absolutely and strictly glabrous, as is also that of the smaller valve. *Valves* of the *corolla* much broader than in *Sp. stricta;* usually rather shorter in proportion to the larger calyx-glume, and I think somewhat less acute than the valves in *stricta;* but except in regard to breadth, all these marks are liable to great variation. They are not unfrequently bearded like the glumes with bristly, or rather spinous hairs, a few of which are often, but not always, observable along the back or outward edge of the valves, particularly of the exterior or smaller one. The interior

embraces the stem, and of course takes its cylindrical curvature; in which case a slight pressure with the finger of the leaf just above its origin against the culm, by flattening the former, renders its true outline instantly apparent.

[1] Thirteen is the greatest number I have myself counted.

[2] An excellent and very permanent character, distinguishing it from *Sp. stricta*, in which the rachis is very little longer than the terminal floret, and usually quite straight or subulate.

[3] The relative length of the calycine glumes is too variable to be taken as a character; they approximate, however, in the main, to something like stability.

[4] So it is sometimes in *stricta*.

or larger valve is very commonly sprinkled with fine scattered hairs, but this is far from being constantly the case. *Anthers* yellowish-white at first, but turning darker after long protusion, as do also the delicate, white and feathery *stigmas*. *Styles* cohering (not truly united) for a great part of their length. *Seed* scarcely examined, as it seems, on dissection of a great number of florets from various specimens gathered on parts of the station remote from each other, that our *alterniflora* seldom perfects its fruit at Southampton.[1] The *ovary* appears in most cases shrunk to an invisible point, the floral valves enclosing merely the shrivelled remains of the styles, or at best, now and then a half-formed abortion, hardly to be called a seed. Is not this fact in itself a strong presumption, were other proof wanting, that our *alterniflora* and *stricta* are two genuine, though closely allied species?—but more on this head in the sequel. I cannot discover the smallest trace of a second floret in either of our English species.

The following table exhibits, under one view, the distinguishing characters of both our British *Spartinas*.

SPARTINA STRICTA. *Auct. anglican.*	SPARTINA ALTERNIFLORA. *Loiseleur.*
Specific Character.	*Specific Character.*
Spikes few (two to three); flowers very hairy; larger calyx-glume simply acuminate; sheaths distinctly articulated at their summits; leaves shorter than the flower-spikes, tapering at the base; lower ones deciduous; rachis scarcely produced beyond the terminal florets of each partial spike.	*Spikes* numerous (four to thirteen); coarctate; flowers glabrous; larger calyx-glume with strong lateral nerves, emarginate below the apex, which last is crowned with a fascicle of bristly hairs. Leaves continuous with the sheaths, longer than, or equal to, the flower-spikes, dilated at the base; lower ones persistent; rachis much produced beyond the terminal florets of each partial spike, into a flexuose awn-like point.
DESCR. *Root* creeping, with few fibres, not much branched.	DESCR. *Root* creeping, with copious matted fibres; very much branched, and minutely divided.
Culm ascending at the base, mostly curved; somewhat tough; ten to fifteen inches high, colour pale dirty-yellow, or greenish.	*Culm* mostly quite upright, or very slightly ascending at the base; stout, reed-like; somewhat brittle; colour fine reddish-yellow, or green; rich tawny when ripe.
Sheaths closed nearly to their summits.	*Sheaths* open considerably below the summit.
Leaves tapering upwards from the sheath; scarcely broader at their base than the culm; distinctly articulated with the sheath; mostly much shorter than the spikes, or more rarely subequal with the latter; lower ones falling away from the sheaths in decay.	*Leaves* much broader than the culm at their base, where they suddenly dilate; no distinct articulation at their union with the sheath, of which they appear simply a continuation; mostly much longer than the compound spike, or just equal to this last, lower ones attached in decay to their sheaths.

[1] Perhaps neither this, nor *Sp. stricta*, mature seed abundantly any where in the wild state, like many other plants that run extensively by the root. At Southampton, *Spartina stricta* shows a much more decided tendency to produce perfect seed than *Sp. glabra*, in which hardly ever more than the rudiments, and often not even these, are discoverable: and in *stricta* itself, the seed is seldom well filled, and is probably incapable of germinating. *Sp. alterniflora* appears to advance to maturity sooner than *stricta*, fading into the "sere and yellow leaf," whilst the latter is yet green and vigorous.

Spikes few, mostly two (seldomer three); rachis scarcely produced beyond the ultimate floret of each partial spike into a subulate point.	*Spikes* numerous; four to thirteen (mostly six or seven), very unequal; partial rachis much produced beyond the terminal floret into an awn-like, flexuose point.
Florets very hairy, larger and narrower than in *Sp. alterniflora* (usually about one-fourth), colour, yellowish-grey, or dirty ash.	*Florets* smaller and broader than in *stricta*; smooth; colour, clear straw-yellow.
Calyx-glumes long and narrow; larger glume terminating in a simple, or bifid acute point. Smaller glume (usually) much more than half the length of the larger,[1] linear, almost filiform.	*Calyx-glumes* broader in proportion to their length than in *stricta*; smaller one often not more than about half the length of larger,[1] which last is emarginate below the apex, and mostly crowned with a fascicle of white bristly hairs.
Corolla-valves as in *Sp. alterniflora*; perhaps a little more acute; smooth.	*Corolla-valves* broader than in *stricta*; often somewhat hairy.
Seed compressed; smooth, with a recurved beak, crowned with the withered styles.	*Seed* seldom perfected; similar in form to that of *stricta*.

[1] This character is the most liable to exceptions of all, and is therefore unfit to compose any part of the specific definition. The generality of these proportions in the two calyx-glumes of either species, is clearly evinced in the average of florets examined collectively.

It is of importance to remark, that the Southampton *Spartina* presents no gradations by which it may be said to merge imperceptibly into the ordinary *stricta*. In all its phases it preserves its identity. *Sp. stricta* occurs (and I have been at great pains to ascertain the exact limits of each species with us, to prove the fact of their distinctness by the strongest evidence) only *below* the Itchen Ferry,[1] that is to say, near where the Itchen river enters the Southampton water; and is there confined to a few spots, and those of limited extent. On this lower station *Sp. stricta* grows close to patches of *Sp. alterniflora*, (which is still the prevailing species,) yet never mingling with the latter; nothing can be more unsociable than our two *Spartinas*; both eminently gregarious Grasses, but each herding with those of its own kind, with an exclusiveness uninfluenced in the least by similarity of habits resulting from intimate relationship.

On the vast mud-banks *above* the Itchen Ferry, and on both sides alike, *Sp. alterniflora* abounds, occurring in the utmost profusion where not a single plant of *stricta* shows itself. In the firmer and drier parts of both stations we find starved and stunted individuals of all sizes, which, though not larger, or even much less, than full-grown specimens of *Sp. stricta*, constantly retain, on a reduced scale, the more fibrous root, stouter habit, longer leaves, unjointed and dilated leaf-bases, and glabrous florets; and this, when from a deficiency of nutriment or other deteriorating causes, the spikes have been reduced to four or five from their medium amount of six or eight. On the lower station this diminutive form of *alterniflora* may be gathered within a couple of yards of the true *stricta*, yet so different is the aspect of this last, that the eye discriminates betwixt them at a glance. In vain should we look for the continuous sheath, crowned towards the lower part of the culm with the withered, but persisting leaf, on the same plant, having twin, or triple spikes, and hairy florets; and equally futile

[1] I cannot find *Sp. stricta* between Southampton and Millbrook, as mentioned by Mr. H. C. Watson, in his "New Botanist's Guide," on the authority of Mr. Winch. Is this the same station as that quoted immediately after from the old "Botanist's Guide," or is the latter our locality for *alterniflora?* if so, it should stand thus—*Sp. glabra*, on the banks of the Itchen river, within high water-mark, in great plenty.

were it to expect the strongly articulated leaf-base in association with a many-spiked and smooth inflorescence.

A sufficient number of facts have, I flatter myself, been brought forward to demonstrate our plant to be unequivocally distinct from the old *Sp. stricta* of this country, and of other European regions. I felt, however, desirous of having the decision of abler judges, and to ascertain from inspection of such Herbariums as I could gain access to, if it already existed in the older British collections as an indigenous species; whether it were a well-known, but foreign plant; or one which yet remained to be described. On first suspecting the Southampton *Spartina* might prove distinct from *stricta,* I requested the opinion of Mr. Borrer on the subject, sending him, at his desire, a quantity of the fresh plant for cultivation, with a detail of such characters as I had already observed. His opinion, at first given with hesitation, has since been avowed in favour of its claim to rank as distinct, and decidedly against its being a mere luxuriant variety of *Spartina stricta,* for which it has doubtless been taken, and passed over by many. In his letter, Mr. Borrer first pointed out to me the strong lateral nerves of the larger calyx-glume that had escaped my observation, and which I constantly find to afford an excellent character, in addition to those I had before brought under his notice. My friend, Mr. Babington, who examined our *Spartina* with me, when I received the pleasure of a visit from him in September, expressed himself quite convinced of its being truly distinct; and I learn from Mr. Borrer, that both Mr. Woods and Mr. Forster have arrived at the same conclusion with ourselves.

To ascertain if our species were already known or described, I had recourse to such systematic works as lay within my reach, (from which, till aided by specimens, I could glean nothing absolutely decisive,) and to the Herbariums above referred to.

In the Banksian collection, British Museum, is a specimen from North America, (precise station not given,) but without lower leaves, agreeing in all other respects with the English Grass, and marked in pencil, "*Dactylis strictæ affinis et forte varietas.*" Moreover, in Sir J. E. Smith's Herbarium at the Linnæan Society's, are two examples of a *Spartina* from Dr. Boott, gathered in America, (New England,) in 1817 and 1824, coinciding in every essential point[1] with our English plant, and which is referred to Pursh's *Limnetis*[2] *polystachya* for a synonyme. Previous to this search, Mr. Babington had informed me, that Mr. Borrer believed he possessed the Southampton plant from America, and on my return home from London, I found a parcel of plants from that gentleman, amongst which, with his usual kindness, he had inclosed a specimen of the transatlantic *Spartina* as the *glabra* of Mühlenberg, and *lævigata* of Link, with the notice, that Mr. Babington and himself, on careful comparison, considered it as identical with that from the Itchen river.

Mr. Borrer's American specimen of *glabra,* as far as a comparison with a single example, and dissection of a few only of its florets enables me to judge, is precisely our English plant in every essential particular, *i. e.* in the numerous, unequal spikes, glabrous florets, bearded apex of the larger calyx-glume, and its strongly prominent lateral nerves; finely-produced rachis; and lastly, in having, like our's, leaves continuous with their sheaths.

Mr. Borrer's plant is, however, much more rigid, especially in the leaves, which well deserve to be called pungent; an epithet hardly applicable to either of the British species, at least when recent.[3] The compound spike is also less erect, and as well as the stem, has a considerable curva-

[1] Excluding, of course, such as could only be ascertained on dissection.

[2] *Limnetis, Trachynotis,* and *Spartina,* are all names for the same genus; a part of the Linnæan *Dactylis.*

[3] I have since found that this greater rigidity is merely in consequence of the leaves becoming involute in drying, for want of pressure, as mentioned further on; for some specimens of *alterniflora,* laid by without pressing, assumed all the stiffness and pungency, in addition to the other characters of my American duplicate, of which they are, in that state, the perfect counterparts.

ture. The leaves in my American specimen are involute to their base, but this I attribute to their shrinking in the process of drying, evidently conducted with little or no pressure, as the culm retains its cylindrical form almost unaltered. The absence of the root, so different in the two plants, and the apparent loss of the uppermost leaf, precludes the possibility of comparison with one another in these organs, which would have materially assisted in setting the question of their identity at rest; of which, however, there can hardly, I think, be two opinions.

There appears to prevail some confusion amongst authors between *Spartina glabra* and *polystachya;* the latter is quoted as so named by Willdenow, but does not occur in his edition of the *Spec. Plantarum.* I concluded from Michaux's description of *Sp.* (*Trachynotis*) *polystachya,* as far as it goes, that his plant and our Southampton species were the same, and Trinius's account of *polystachya,* which is a much more detailed one than Michaux's, and suits our English species exactly, coupled with the specimens marked *polystachya* in Smith's Herbarium, apparently on the authority of Dr. Boott, nearly banished every doubt from my mind. Not having Mühlenberg's work to refer to, I cannot recall his description of *Sp. glabra* or of Link's *lævigata,* which I believe are the same; but I find the following note upon these authors, made in the British Museum, implying a suspicion as to the validity of the species — "*Sp. glabra,* Mühl., *Sp. lævigata* of Link, appears, for I have seen no examples, to be a dubious species too closely allied to *polystachya.*" The *Spartina glabra* seems to be known to Botanists hitherto only as a native of the New World, unless the *Sp. alterniflora*[1] of Loiseleur, found at Bayonne, be a modification or race of *glabra,* which I am told it resembles. That our Southampton plant is *not* a mere variety of *Sp. stricta,* I am now fully convinced, though for some time unwillingly disposed to think it so, till I had gradually discovered its numerous and marked peculiarities. I have visited the stations of both species ever since the beginning of August, on an average twice or thrice a-week, for the purpose of studying each in its advance to maturity, yet have never fallen in with a single specimen that, by its equivocal characters, could originate a suspicion of the two plants being varieties of one another, produced solely by casual differences of soil or luxuriance.

Judging from numerous examples of *Sp. stricta* I have examined in Smith's, Buddle's, the Linnæan, and Banksian[2] Herbariums, this species does not seem liable to variation from soil, climate, or the like causes; specimens from Africa agreeing exactly with those from our English coasts; neither do those from remote parts of our own shores differ amongst themselves in any respect. Besides, were our *alterniflora* a mere accidental variety of *stricta,* we

[1] It should be observed, that throughout the MSS., in speaking of the new British *Spartina,* Dr. Bromfield, not having had the means of comparing it with the *S. alterniflora* of Loiseleur, from Bayonne, called it *S. glabra,* which name I have, with his permission, changed to the older one of Loiseleur, on finding the two plants to be identical. Its synonyms will stand thus —*S. alterniflora,* Loisel. Fl. Gall. v. 2. p. 719 (1807), *S. glabra,* Mühl. Gram. p. 54 (1817). *S. lævigata,* Link. Jahb. 3. 92 (after 1820). *Dactylis maritima,* Walt. Carol. p. 77 (fide Mühlenb.).—I am not sure whether the circumstance of this plant being found in France, as well as in England, will give it a further claim to be considered an aboriginal native of Europe: for in both countries it is only known to inhabit one spot, and that a sea-port, where it might have been brought in ballast. In America it is not exclusively a maritime plant, for Nuttall found it growing up the Missouri as far as Fort Maudan, sixteen hundred miles above the junction of that river with the Missisipi. From this plant the *S. polystachya* (*Trachynotis,* Mich.) is very distinct. See Dr. Asa Gray's "*North American Gramineæ* and *Cyperaceæ,*" where most beautiful specimens are given of four species, in Vol. I, No. 5, of *S. juncea,* Willd.; No. 6, of *S. alterniflora,* under the name of *S. lævigata;* in Vol. II, No. 101, of *S. cynosuroides,* Willd.; and No. 102, of *S. polystachya,* Willd.—Ed.

[2] Among the specimens (eight in number) of *Sp. stricta,* in the Banksian Herbarium, including one from Africa, the rest from various and distant stations, it is remarkable there is a single example from *Southampton,* but which is no other than the true *stricta* of that locality, and which is, as we have seen, by far the rarer of the two growing there now. Mr. Borrer tells me that his Sussex *stricta,* gathered at West Itchenor, is precisely that of the Suffolk coast.

might expect to receive this last from America; yet I cannot learn that it is a native of that continent, or noticed as indigenous by any author on American Botany. We shall see reason immediately for suspecting that our Southampton *Spartina* may have been introduced from the western hemisphere.

The proportion in quantity between *Sp. alterniflora* and *stricta* at Southampton is very unequal, the predominance in favour of the new species being, on the most moderate estimate, at least ten to one. *Sp. alterniflora* seems, as far as I can ascertain, to be the only kind above the Itchen Ferry, where it occurs in vast profusion, in irregular patches or fields of very various dimensions, from a dozen yards to two or three hundred in circumference, thickly scattered over the great beds of mud and ooze, partly covered, and partly above the surface at high water, the treacherous and shifting soil of which, our plant, amongst its other valuable qualities, contributes, with its densely fibrous and matted roots and runners, materially to consolidate. These Spartina-swamps extend along each side of the river, beginning just above the village of Itchen, to within a few hundred yards of Northam bridge, beyond which I have never met with either kind. Our *Spartina* adds to the richness of the view from Pear-tree Green, and other elevated spots, by the mellow tint of its masses that clothe the shores; the culm and leaves acquiring, in incipient decay, at this season, (Oct. 23rd,) a fine reddish brown or tawny hue, totally unlike the pale, dull, ashy colour which *Sp. stricta* puts on late in the year. Below the Ferry, and descending towards the junction of the Itchen and Southampton rivers, *Sp. alterniflora* re-appears in smaller quantity and of less luxuriant growth; and here, for the first time, *stricta* begins to show itself in detached portions, often growing side by side with the former, but *never mingling with it.*

The people employed about the Ferry are unanimous in asserting, that *Sp. alterniflora* was not found *below* that point till of late years, it being a tradition among them that the plant was brought from some place higher up the stream on the first melting of the ice after a hard winter, about twelve or fourteen years back, as far as I can collect, though of the precise date no one pretends to speak positively. Nor do any of them profess to know how long it has been growing *above* the Ferry, though all agree it is much more abundant there now than ever, and is still increasing annually. One old man declared to me, he remembered it all his life on the upper station; another that there was none of it in his younger days; it is difficult to reconcile such conflicting accounts, except by supposing different plants to be confounded together,—*Scirpus maritimus*, perhaps, which is plentiful along the shore, yet far less so than our *Spartina*. I have traced its termination upwards, which finishes below Northam bridge. Much higher it could not occur, as the Itchen soon loses the character of a tide-river, and at Wood Mills, not above three or four miles from its junction with the Southampton estuary, becomes a fresh-water stream.

It is possible our Southampton *alterniflora* may have been imported from America, either in ballast, or as a packing material in stowing the hold, and so have become naturalized with us. Its prodigious quantity is against the supposition; and indeed we are only justified in suspecting its exotic origin from the account just given, (one not very conclusive of the inference,) and from the fact, that as far as we know, this species of *Spartina* has not before been detected elsewhere in this or any other European country. [See the note by the Editor, at p. 61. Ed.].

The poorer classes of Southampton employ *Spartina alterniflora* for thatching the roofs of out-houses,[1] cattle-sheds, &c., in lieu of reeds; more extensively for litter, and subsequently as manure. Horses

[1] A labouring man, with whom I conversed on the uses of our *Spartina*, assured me he remembered it growing upwards of twenty years; had formerly employed it to thatch a part of his own premises, and found it outlast two courses of straw, as a material for roofing in.

are stated to eat it greedily, and for all these purposes it is regularly mown at the end of September, at which time large quantities may be seen lying on the shore to dry, previous to carting. Hardly a single accessible patch either on the upper or lower station is suffered to remain uncut, so that it is a plant of real economical utility. I cannot learn that it is known amongst the inhabitants by any other name than that of Sedge.

Southampton, Oct. 29, 1836.

ACCOUNT OF A BOTANICAL EXCURSION INTO BRITTANY, IN A LETTER ADDRESSED TO THE EDITOR.

By Joseph Woods, Esq., F.L.S.

My dear Sir William,

You did me the honour to insert in the *Companion to the Botanical Magazine* my journal of a little tour in the North of England. Perhaps some of your readers may find advantage in perusing the following memoranda of an excursion in Brittany. I, at least, should have been very glad of some such intimation respecting the nature of different parts of the country, and of the points to which, as a Botanist, I might, with the best hope of success, direct my attention. But neither in books, previous to leaving England, nor on the spot, by oral communication, could I obtain any satisfactory information. I do not pretend to be able fully to supply the deficiency; but something towards it will, I trust, be found in the following pages.

I left Lewes on the 2nd of May, and on the 3rd crossed over to the Isle of Wight, to gather *Pulmonaria angustifolia*. I followed the road to Brading for about two miles and a half, where the plant begins to appear, extending itself in great abundance over some hundred acres of woodland. On the 4th I returned to Portsmouth, expecting to sail that morning to Havre; but the packet had been retarded in its homeward passage by a strong North wind, and did not return till the following day. Meanwhile I took such a walk on the shore at Portsmouth as the weather would permit. *Cerastium semidecandrum* grows in great abundance on the ramparts, *C. tetrandrum* on the shore. The latter is a more loose and straggling plant, and its leaves are smaller in proportion to its general size; but in depressed spots I could find specimens of an intermediate appearance, which seemed to differ only in the number of stamens; and this difference is not constant, as flowers with four and five stamens may sometimes be seen on the same plant. All the sepals in both are scariose at the tip; while the outer sepals, at least, of *C. vulgatum* are, I believe, never so. The bracteas are not scariose in either species, but in *C. viscosum* the upper bracteas are perhaps always scariose at the margin. Duby mentions a variety of *C. semidecandrum*, in which the sepals are scariose at the tip, (this, with me, is a character of the species,) and another in which the bracteas are scariose.

Our voyage to Havre took twelve hours, which is probably about an average passage; for though we had a head wind, the sea was quiet; and on the 6th I crossed the estuary of the Seine to Honfleur. A steam-packet passes every tide, and a diligence attends to receive the passengers for Caen. A diligence from Rouen to Caen also starts about noon. Honfleur is a delightful town; orchards cover the steep slopes of the neighbouring hills, and these, at a distance, give place to forests; and the noble estuary of the Seine spreads itself before the eye, chalk cliffs or steep woody banks, breaking down, in many places, to the water's edge.

I shall say nothing of the two magnificent churches at Caen, built by William the Conqueror and his Queen, as an atonement for their marriage within the forbidden degrees of consanguinity; nor of the later edifice of St. Peter, which is, nevertheless, a fine and interesting building. These are foreign to my present subject. The Botanic Garden is in a young state, but promises well. *Fedia carinata* is

common here, and, as I found afterwards, throughout the country. It seems an earlier plant than even *F. olitoria*, and I confess myself unable to discriminate the two by their habit, though the structure of the seed is so perfectly distinct, that there cannot be a doubt of the species.

I was told at my inn at Caen, (a very good one, the Hotel de France,) that there was only one diligence in the day to Bayeux, and that it set off at six in the morning. I however found that there were two starting at eight in the morning, and another at four in the afternoon. I mention this, in order to observe, that the traveller in France must not depend on any information on these points, which is not derived from the bureaux belonging to the establishment, or at least from the inn at which the diligence stops.

We arrived at Bayeux at half-past ten. I visited the cathedral, which is a very fine edifice, with some remarkable peculiarities, and after looking at the celebrated tapestry, took a walk, which was unrewarded with any botanical success. At Caen the country is open, while at Bayeux it is all enclosed, full of orchards; small pollard oaks abounding in the hedge-rows; and without any marked elevation whence we might obtain a general view of the country. On the 9th I proceeded to Coutances, passing by the way through a forest of *Beech*, and some very agreeable and well-varied ground. Here also is a fine cathedral, but of later date. The country is pleasant, but the very cold weather renders vegetation backward. I here first observed a *Stellaria*, which is perhaps the *Alsine grandiflora* of Tenore. About Rome grows what I considered a variety of *Stellaria media*, with ten stamens, which I had supposed to be the plant of Tenore; but finding the proportionate length of petal and sepal (the character pointed out by that Botanist) to be very variable, I paid it no further attention. I now consider it a different species, resting its claims to distinction on the number of stamens, and on the length of the flower-stalk, which exceeds the leaf; while, in the common species, though it lengthens considerably afterwards, yet while the petals remain, the stalk is shorter than the leaf. Both plants were growing abundantly together, and the one as large and vigorous as the other; but in *S. media* the stamens were never more than five, and in ninety-nine flowers out of a hundred, did not exceed three, the two which should have been opposite to the outer sepals of the quincuncial calyx being almost always wanting. In *S. grandiflora*, on the contrary, the number was invariably ten. The petals of the latter are generally longer, and their segments always broader than in the common plant, so that the flower is more showy. *Barbarea præcox* is not uncommon in cultivated land in this part of Normandy, and *Ranunculus parviflorus* is very plentiful. I observed *Convallaria multiflora* in the woods, and a *Narcissus* out of flower, which I could not determine. There was also a variety of *Anemone nemorosa*, with blue flowers. I have heard of such an appearance near Tonbridge Wells, but this is the first time I ever met with it. Something remains yet to be done with respect to colours in Botany. Many flowers vary very much in this respect, but still within certain limits. We have no *blue Rose* nor *blue Ranunculus;* and even in whole tribes the colour never transgresses a fine but distinct limit.

Some springy ground offered to me *Leontodon palustre*, *Scorzonera angustifolia*, and *Cnicus pratensis?* or perhaps *C. tuberosus* (*bulbosus* of Duby), for it was not in flower, and I did not particularly examine it, and *C. tuberosus* seems much the most common in this part of France. There is no great difference between them, for *C. pratensis* has thickened fibres to the roots, which might be called tubers, while the leaves of *C. tuberosus* are sometimes hardly divided. On a heath there were a few plants of *Erica ciliaris*, but of course not in flower, and in some pools, *Alisma natans*. All these are common productions of the North-West of France, as are also *Linaria repens*, *Fumaria intermedia*, *Scolopendrium Ceterach*, and *Cotyledon Um-*

bilicus. *Anthriscus Cerefolium* is very generally cultivated in gardens, and thence escapes into the neighbouring hedges. I observed also *Mespilus Germanica* and *Fumaria claviculata*.

On the 11th I secured a place in a stage for Granville, but got out at about halfway in order to botanize on the shore. The walk proved long and tedious, through crooked lanes in a level country down to the sea, of which I had no view till I came close upon it. I just touched the point of a range of wooded sand-hills, extending North. The wood, however, has been planted at no distant period, and consists principally of the *Black*, with some intermixture of *White Poplar*. Towards Granville it is still sandy, but flat, with an immense expanse, occasionally covered by the tide. Granville itself stands on a rocky promontory, and makes a good object. *Fedia carinata* and *Stellaria grandiflora* are again very abundant. The sandy shore offers *Schœnus nigricans*, *Knappia agrostidea*, *Poa bulbosa*, *Elymus arenarius*, (I believe, but at this season I could judge only by the foliage,)—*Arenaria tenuifolia*, *Hutchinsia petræa*, *Turritis hirsuta*, and *Scorzonera angustifolia*. There was abundance of *Trichostomum canescens* in fruit. The rocks about Granville looked very gay with *Statice Armeria*, *Silene maritima*, and *Saxifraga granulata*. *Borkhausia præcox* also occurs on the hills. On the 12th I walked on the shore, adding nothing to the Botany of the former day, except *Medicago minima* and the variety of *C. semidecandrum* with scariose bracteas, (*C. pellucidum*, *Fl. Agen*,) which, if not a variety of *C. viscosum*, is probably a species. The stamens are uniformly five; the petals shorter than the calyx, and somewhat erose, or with an irregular notch at the end.

At three o'clock I set off for Avranches, which crowns a considerable eminence, and commands most beautiful views on all sides, and the next day proceeded to Rennes through a close and nearly level country. In the evening I visited the Botanic Garden, which I am sorry I cannot praise. The plants have suffered a great deal from the late frosts of this spring, which lasted even into May. I took a walk on the 14th. There are numerous footpaths through the meadows, and borders are generally left to the cultivated fields, so that it is not an unpleasant country for a stroll. The plants were *Lepidium Smithii*, which is abundant throughout Brittany (I confess the South of Europe *L. hirtum* seems to me the same species, but this is indubitably the English plant), *Hieracium dubium*, *Œnanthe peucedanifolia* (the latter is very abundant about Rennes and Nantes, but does not extend to the extreme West; its roots are eaten), *Sisymbrium Irio*, and *Fumaria capreolata*.

At five in the afternoon the diligence started for Nantes, where we arrived a little after six on the following morning.

Nantes is a large city, but its foreign commerce is said to be leaving it, on account of the increasing difficulties of the navigation of the Loire. Here I formed an acquaintance with two Botanists, Mr. Hectot, and Mr. J. Lloyd, a young Englishman, who has not long made it his pursuit. By the advice of the former, the latter conducted me to the Baie de la Verrière, a boggy creek communicating with the River Erdre, itself a tributary to the Loire. The English Botanist would do well in such cases to ascertain what he may expect to find, otherwise he will be conducted to local rarities, which are likely to be common elsewhere, and this is especially the case with the marshes and rich meadows to which the French Botanists are eager to take their English friends. In this case I knew that we might expect *Lathræa clandestina* and *Serapias cordigera*, in our way to the *Baie*. The first was abundant at the foot of a row of *Lombardy Poplars*, before crossing a small creek, called the Marais du petit Port. I had once before found this highly curious plant, whose stem and leaves are subterraneous, its flowers alone rising above the surface, but never in sufficient quantity to satisfy me. I was therefore delighted to meet with it again. *Serapias cordigera* was on the border of some wet meadows at La Tertre.

In these spots was abundance of *Orchis laxiflora*, *Œnanthe peucedanifolia*, and *Carum verticillatum*; all three, however, are plants exceedingly common in this part of France. The *Carex*, which makes, as it were, the foundation of the marsh called the Baie de la Verrière, differs from *C. cæspitosa*, in having the scales of the female catkins acute, instead of obtuse, with a point; and from *C. stricta*, in wanting the net-work at the base of the leaves. The catkins are too short and erect for *C. acuta*. Besides this we observed *C. pseudo-cyperus* and *C. curta*. *Oxalis corniculata* is common by the road-sides about Nantes. The dry rocky banks furnish *Asphodelus albus* and *Brassica Cheiranthus*; but a Botanist of Nantes would no more think of taking a stranger to gather these, than an inhabitant of the neighbourhood of London would show a Naturalist from Brittany *Carduus acanthoides* or *Brassica campestris*; both which plants are, however, unknown in Brittany.

On the 18th I took place in an omnibus, which carries one for three sous, about two miles down the banks of the Loire, and then turned up amongst some vineyards, which are not common in this district. *Ranunculus tripartitus* abounds in two or three pools, which seem to have been old quarries; but I would not venture to pronounce it distinct from *R. aquatilis*. *Cardamine parviflora* grows in the same place, and *Ornithogalum umbellatum* just by. The other plants were *Poa bulbosa*, *Iberis nudicaulis* (a very common plant in Brittany), *Fumaria claviculata*, and a variety of *Trifolium striatum*, with the heads of flowers in pairs (this I at first took for *T. Bocconi*, which is said to grow near Nantes), *Eryngium campestre*, and *Senebiera didyma*; *Aristolochia Clematitis*, *Herniaria glabra*, and *Calendula arvensis* in the vineyards.

19th. By the steam-boat to St. Nazaire, Mr. Lloyd and I arrived at our destination at about one o'clock, and walked along the shore westward. The scenery has few attractions, and we had nothing but our Botany to amuse us. On the sands we gathered *Linaria supina*, *Galium arenarium*, *Carex divisa ?* *Bromus diandrus* (or rather *Madritensis*, which is the older name, and almost universally adopted by continental Botanists): and behind them, *Polycarpon tetraphyllum*, *Trifolium maritimum* and *Michelianum*, *Alopecurus bulbosus*, *Inula Helenium*, *Scrophularia Scorodonia*, and *Arenaria montana*. We missed *Antirrhinum arenarium*, *Dianthus Gallicus* and *Ephedra distachya*, probably from not having gone far enough, as they are stated to grow rather nearer Le Poulignen than St. Nazaire. The two latter, however, could not have been yet in flower.

Next morning we engaged a cabriolet for Montoir, in order to examine some peat-bogs, which we found, however, to lie much more distant than had been represented to us, and having ascertained that they were at the present moment under water, we returned *re infectâ*. Our course was over an extensive flat of clayey meadow-land, of which the herbage consisted almost entirely of *Trifolium resupinatum*, *subterraneum*, and *maritimum*, *Alopecurus bulbosus*, *Carex divisa*, and *Œnanthe peucedanifolia*. In the latter part of our walk, towards St. Joachim, the soil was somewhat peaty, and furnished abundance of *Cnicus tuberosus* and *Scorzonera angustifolia*. *Alisma Damasonium* also occurred occasionally.

We could not procure a boat on the 21st to take us to Paimbœuf, but we engaged one to put us across to Fort Muidin, whence we walked to Paimbœuf, finding, in our way, either on the sand-hills, or among the moist meadows behind them, all the plants of the day before, besides *Ranunculus ophioglossifolius*, *Rubia peregrina*, *Potentilla alba* (*var. splendens*), *Orchis laxiflora*, *Trifolium incarnatum*, *Vicia lutea*, *Poa procumbens*, *Scrophularia Scorodonia*, and a variety of *Plantago maritima*, with a branched spike. There is a diligence from Paimbœuf to Pornic, a bathing place frequented by the people of Nantes, and where I thought there might not be bad botanizing. The productions of the two places would probably be too much

alike to induce a passing Botanist to visit both this and St. Nazaire; but if he should prefer the latter, he had better not stop there, but push on at once to Le Poulignen and La Croizie. If the peat-bogs are to be visited, this would be most advantageously accomplished in union with a considerable forest between Pont Château and Roche Bernard, on the road from Nantes to Vannes. These bogs sometimes catch fire, and burn for a considerable time. If, on the contrary, the Naturalist should choose Pornic, he may visit from thence the Isle of Noirmoutiers, the most northern station for *Pancratium maritimum* and *Amaryllis lutea.*

On the 23rd of May I left Nantes in a steam-boat, which ascended the Loire. I had before seen the Loire at Tours, and lately between Nantes and the sea, and thought there was little in it to justify its reputation for beauty; but I must acknowledge that between Mauve and Ancenis, the scenery is delightful; and though extremely different in effect from that on the Rhine below Bingen, yet the rocky banks which bound the stream are much of the same nature in both, and present very similar forms. The great disparity lies in the respective proportions, the Loire being perhaps three times as wide as that part of the Rhine, while the rocky banks of the Rhine are thrice as high as those of the Loire. I landed at La Poissonnière, and walked up to Savennière, where there is a church which I wished to sketch, said to be the oldest in France. We had thunder and drizzling rain, and it was very cold, so as to be much hindered both in botanizing and drawing. The plants I found about Savennière were *Ranunculus chærophyllus, Draba muralis, Turritis glabra,* †*Sisymbrium Pyrenaicum, Silene nutans, Geranium purpureum,* (*G. Robertianum,* in this neighbourhood, almost uniformly putting on this appearance,) *Lathyrus sphæricus, Trifol. maritimum* (two-headed), *T. striatum, Potentilla argentea, P. alba, var. splendens,* †*Peucedanum Parisiense, Rubia peregrina, Hieracium Auricula, H. pulmonarium, Andryala sinuata, Pulmonaria angustifolia,* †*Verbascum pulverulentum, Veronica acinifolia, Stachys recta, Mentha rotundifolia, Melittis grandiflora, Plantago maritima, Daphne Laureola, Aristolochia Clematitis, Euphorbia Esula, E. Cyparissias, E. Characias, E. platyphylla, Quercus Toza, Alisma natans, A. Damasonium, Orchis viridis, O. ustulata, Ornithogalum umbellatum* and *Hyacinthus comosus.* (The plants marked † were not in flower.)

On the evening of the 25th I went to Angers, and on the 26th called on Mons. Desvaux, but without meeting him, as he was out on a botanical excursion.

The Flora of Anjou seems to present an interesting union of plants from the North and South, East and West. The limits of the ancient Anjou nearly coincide with those of the Department of the *Maine et Loire.* This contains an area of 718,807 hectares, equal to 1,776,000 acres, or about 2,700 square miles. The Flora published by Desvaux contains eleven hundred and eighty-three species, a large number for such a district, where there are no mountains, and no sea-shore, and it is not increased by the addition of garden-plants, as is the *Flore Française,* nor by an undue multiplication of species; for although there are some which must, no doubt, be rejected; there are, I think, full as many considered by the author to be mere varieties, and omitted in the enumeration, which I am ready to acknowledge as species. Of these eleven hundred and eighty-three, two hundred and thirty-nine are not found in the British Islands, and two hundred and eighteen more would be considered as rare with us; so that of every thirteen species observed by a British Naturalist, five would probably be interesting subjects of remark, even if he had them already in his collection. This is a much richer harvest than would reward a mere English Botanist in Brittany; but if, on the other hand, he had investigated the neighbourhood of Paris, he will find the number of novelties greatly diminished, while those of Brittany would be little affected. Desvaux professes not

to pay much attention to the precise local habitat, but rather to explain the soil and circumstances under which the plant is found.

As my object is to assist the traveller in his researches, by pointing out to him the localities to which he may, with most hope of advantage, direct his attention, it may not be amiss to extract some of Desvaux's notices on this head.

"In the immediate neighbourhood of Angers, to the West (by the map it would appear to be to the N. W.), the shores and surrounding slopes of the pool of Saint Nicolas are truly rich, especially in Cryptogamous plants. The wood of La Hage, which joins it, is become private property, but most of the plants which it contained may be found in the adjoining wood of Avrille. In both the soil is schistose.

"Half a league S.S.E. of Angers, is a place called Les Justices, where in some ancient hollows formed by digging for slate, a rich harvest may be made. Les Fourneaux on the North (qu. N.E.), and almost at the gate of Angers, present many of those which affect a calcareous soil, though the quarries have a good deal disturbed the face of the country. These plants are seen more abundantly, further on at Pelouailles, two leagues N. N. E. of Angers. Towards Briolay, about the same distance on the N., and in the environs of La Roche Fouque, we also find plants which prefer the limestone, while Soucille, about a league further in the same direction, offers us several rare species loving a dry sandy soil. At Montreuil Belfroy, only two leagues from Angers, there is a schistose hill rich in species.

"Extending our researches to a greater distance, we find on the South the productive banks which border the valley of the Layon, and S. S. E., at four leagues from Angers, the extensive forest of Brissac, (in this forest the *Menziesia Dabeoci* is found in three different spots,) on the S. E. towards Brain sur l'Anthiou, on an alluvial territory, and above all, towards Beauné, more to the E., in a calcareous district, we meet with many rare species in the meadows and cultivated ground. Towards Louroux, at about the same distance from Angers, the marshes of Le Motais contain some plants not elsewhere found so near to Angers, and at Thorigné and Sceaux, where the soil is sometimes schistose and sometimes calcareous, the borders of the little streams deserve examination. These excursions do not extend beyond four leagues from Angers; but at a still further distance we may visit the marshes, pools, and *landes* of Chaloché at six leagues to the N. W. About the same distance on the S. many rare plants of a limestone district will be found on the hills at Chavaigne, Aubigné, and Briant, and we may visit at the same time the curious siliceous hill near the chalybeate spring of Jouanet, the little plain of Noyers, and the hill of the Fontaine Saint Martin. Towards the W.S.W. in the delightful country of Mauges, we find a varied vegetation, beautiful scenery, and inhabitants the most upright and honest of any in the department of the Maine and Loire. It is the Switzerland of Anjou. The neighbourhood of Segré will yield the Botanist some species which prefer a granitic soil. Still further, at the extremities of Anjou, we may visit with advantage the neighbourhood of Châteauneuf to the N., five or six leagues from Angers, the forest of Chambiers (which furnishes *Helianthemum umbellatum*), and the sands of Durtal on the N. E.; to the North-West, the forest of Ombre, the landes of Chalain, and the environs of Pouancé; and towards the East the forests of Chanlais, Mouleherne, and Louroux, the environs of Noyau and Baugé, and those of Langué, where the soil is sandy."

I have omitted some places, where the account seemed too vague to be useful; but perhaps I ought to notice Château Gautier, several spots in whose immediate neighbourhood are mentioned. Neither the distances nor the direction of the places named, are always in accordance with those in the map, but I am uncertain what is meant by *leagues*. The new post league of four thousand mètres is barely two miles and a half English. The old post league

was a little longer. The league frequently marked in the maps, and there denominated *Lieue commune*, is one twenty-fifth of a degree of latitude, and must therefore be full two miles and three-quarters English, but the *Lieue de Pays* varies from three to four miles. On taking Desvaux's distances in a straight line in *Lieues communes* on the map, they often fall short of their point, and therefore, making allowance for the crookedness of the road, I conclude that the leagues he mentions are the *Lieues de Pays*, which in this part of France may, I think, be taken at three miles and a half.

If I had consulted the Flora of Anjou *before* going to Angers, instead of *afterwards*, I should probably have visited two or three of these localities. But my chief object in this tour was the Botany of Brittany, and it was a wish to examine some very ancient churches, rather than the search after plants, which induced me to deviate into this little expedition eastward from Nantes. I therefore hastened my departure, and on the 27th went to Le Rosier in a diligence with three wheels. There I had to wait an hour and a half for the ferry-boat to Gennes. This is one of the most beautiful spots on the Loire; steep banks covered with wood, or sometimes crowned with a church, descend to the borders of the river, and the beautiful expanse of water, with its woody islands, and the richly cultivated country beyond, abounding in villages and scattered habitations, would have well beguiled the time, had I seen neither churches nor plants. At the little inn, too, where I stopt, the people were remarkably civil, attentive, and cleanly.

On the 28th I walked to Cuneault, where there is an ancient and very fine church, though now partly in ruins, which is attributed to Dagobert; and on the 29th I proceeded up the valley in which the village is placed, and stumbled by chance on two fine cromlechs. The plants of this neighbourhood were—*Fumaria Vaillantii, Alyssum calycinum, Helianthemum guttatum, Silene conica, Geranium rotundifolium, Genista Anglica, Trifolium rubens, Ornithopus compressus, Lathyrus sativus, L. Aphaca, Orobus niger, Potentilla alba, P. verna, Rosa tomentosa, Herniaria hirsuta, Sedum rupestre, S. sexangulare, S. Cepæa, Caucalis daucoides, Galium pusillum, G. tricorne, Fedia coronata, F. Auricula, Borkhausia præcox, Campanula Speculum, C. Rapunculus, Erica scoparia, Linaria supina, Melampyrum cristatum, M. arvense, Veronica Teucrium, Salvia pratensis, Ajuga Chamæpitys, Lamium maculatum, Euphorbia Esula, Orchis aranifera* (with yellow border), *O. militaris, O. coriophora, Satyrium hircinum, Ornithogalum umbellatum, Phalangium bicolor, Convallaria multiflora, Luzula albida, Carex biligularis, Agrostis spicaventi, Bromus Madritensis, B. tectorum, Triticum Nardus.*

On the 30th I re-crossed the Loire to Le Rosier, observing in my way that the waters had sunk nearly two feet, and lamenting that a very short period would deprive this charming scenery of one of its chief ornaments. I resumed my place in the *Trecycle* to Saumur, and in the evening proceeded in the Nyon diligence to Thouars. The next day I got a cabriolet and went to St. Généroux, where there is a church of the eighth century. The valleys here are very pleasant, often rocky and romantic; but the general face of the country is not so, being a wide extent of cultivated land, without trees or inclosures. The wildest of these little valleys is probably that which is known as containing "la cascade," about two miles from Thouars. A tiny rill dribbles over a rock eight or ten feet high; if it had more water, it would be truly beautiful, but it is still a delightful spot, which I enjoyed the more from finding great variety in its Botany. The neighbourhood of Thouars and St. Généroux gave me *Arum Italicum.* This is a very large plant, and often has black as well as white spots on the leaves; but as a species is probably not distinct from *A. maculatum.* The dry calcareous soil furnished *Thalictrum minus, Papaver hybridum, Thlaspi perfoliatum, Neslia pa-*

niculata, Dianthus Carthusianorum, Dianthus prolifer, Genista sagittalis, Lathyrus sphæricus, Caucalis daucoides, Bupleurum rotundifolium, Galium tricorne, Asperula arvensis, Fedia coronata and *F. Auricula, Kentrophyllum lanatum, Anchusa Italica, Melampyrum arvense, Teucrium Chamædrys, Ophrys aranifera, Satyrium hircinum,* and *Bromus pinnatus.* In the moist meadows were *Calepina Corvini, Lotus siliquosus, Valeriana dioica, Borkhausia præcox, Carex biligularis, Cladium Mariscus,* and *Schœnus nigricans. Lathræa clandestina* grows under some wallnut-trees near the river at St. Généroux. On the schistose rocks I observed *Medicago orbicularis, Sclœranthus perennis, Crassula rubens, Sedum Andegavense, Sedum rupestre,* and *Plantago subulata. Momordica Elaterium* and *Ornithopus scorpioides* grew on some dry banks near the Thouars. *Helianthemum salicifolium, Astrolobium sesamoides, Malva hirsuta, Trifolium strictum, Hieracium pulmonarium,* and *Globularia vulgaris,* I noticed only in the valley of La Cascade. In the same place was abundance of an *Iris,* which I suppose to be *I. pumila,* but both its flowers and seeds had disappeared.

On the 2nd of June I returned to Saumur, descending by the steam-boat to Nantes on a thoroughly wet day. The rainy weather continuing, prevented an excursion I had planned to some forests and springy ground between Pont Rousseau and St. Agnan. From the description I had of the nature of the place, and of the abundance and variety of the *Calamariæ,* I should think it the most promising botanizing ground about Nantes. A wood, abounding with *Isopyrum thalictroides,* lies in this direction, but this plant flowers in April, and apparently withers and dries up very early, so that at this season we should hardly have found any traces of it. There is an omnibus from Nantes, which crosses the bridges, a distance of about two miles, for three sous. The descriptions of Nantes boast of these bridges as worthy of notice; but, in fact, the whole series of alternate bridge and island forms the dirtiest and most disagreeable suburb of Nantes. The next day I took a walk with Mr. Lloyd on the Prè de Mauve, a meadow extending for three leagues along the banks of the Loire above the city, which early in the year produces great abundance of *Fritillaria Meleagris.* The plants we found were *Stellaria viscida, Sisymbrium Pyrenaicum, Cardamine parviflora, Campanula Rapunculus, Gratiola officinalis, Trifolium incarnatum,* and the two-headed *T. striatum, Orchis coriophora,* and *Carex acuta.* Above the meadow *Rosa canina,* with very glandular fruit, *Euphorbia Esula,* and one specimen of *Trifolium Michelianum* were found.

On the 6th I proceeded to Vannes. There is a little public-house on the edge of a forest, between Pont Château and Roche Bernard, which might perhaps serve as a point whence to visit the forest and the peat-bogs which can be at no great distance; or the Botanist might stop at Pont Château, as both there and at Roche Bernard, the country is pleasantly varied, and seems hitherto to have been unexplored. The road, in general, is by no means interesting.

Vannes is at the head of the Morbihan, or little sea, an intricate gulf, full of creeks and islands, the shores of which have in places considerable beauty at high water. Here Mr. Lloyd came to me. We had fixed upon this place of meeting, from the uniform, though false testimony of the guide-books, that the celebrated druidical monument of Carnac was in the neighbourhood, and this we intended should form our first object of attention. Our plants at Vannes were *Vicia lutea, Lathyrus Aphaca,* and *Lapsana minima,* among the corn; *Brassica Cheiranthus, Ranunculus chærophyllus, Helianthemum guttatum,* and *Lotus angustissimus,* on banks; *Polycarpon tetraphyllum, Viola lactea* (*V. lancifolia* of *Thore, V. pumila* of *Duby*), and *Agrostis setacea,* on heaths; *Scrophularia Scorodonia* in hedges; and *Carex biligularis* in the meadows.

At half-past nine we set out for Auray,

where we arrived at midnight. The valley on the side of which this town is placed, is rocky and romantic. *Lotus hispidus* and *Linaria striata* grow on the rocky slopes. We took a cabriolet to Carnac, which is three leagues distant, but over so bad a road, that it required three hours to go there. The stones at Carnac are disposed in nine rows, with some additional stones, which in places, seem to indicate the existence of a tenth row. In the part which we first visited, I thought the rows straight; but on a more extended view, this did not appear to be the case. At the West end is a great rock lying flat, which might be supposed to have been an altar. It lies in one of the openings between the rows which in that part seems rather wider than the others, but it is not a central one. There is no appearance any where of a circular disposition of the stones. We saw one cromlech and there is a large upright stone at some distance, which is perhaps connected with this singular monument.

We ascended a detached mound, (on which there is a chapel of St. Michel,) and could not quite make up our minds whether it is natural or artificial; but we rather inclined to the latter opinion, since, as far as we could see, the whole appeared to be a heap of loose stones. Our plants were (about the monument where the ground is sometimes rocky and sometimes boggy with occasional small pools), *Spergula pentandra, Alisma natans* (very common), *Juncus pygmæus, J. Tenageja, Silene Anglica, Vicia angustifolia,* with many flowers, *Sium repens, Verbascum virgatum* (*blattarioides* of *Duby*). Both De Candolle and Desvaux are inclined to consider this latter as a variety of *V. Blattaria*, with which it appears to me impossible to confound it.

On the shore were *Dianthus Gallicus, Linaria arenaria, Festuca sabulicola, Galium arenarium, Köhleria cristata,* and *Herniaria glabra.*

On the 10th we went to L'Orient. There is a cromlech on the road not far from Hennebon. This town seems particularly pleasant. I cannot say the same for L'Orient, but the Hotel de France is a very good inn, and one at which a traveller may well pass a day or two, to complete his notes and take care of his collections.

On the 11th, in spite of a wet morning, we went to Port Louis. Our papers were demanded at the extremity of this little town, and we were then required to show ourselves to the Captain of the Guard, and finally to the Commandant of the place. Afterwards, at the little hamlet of Gave, our papers were again to be exhibited, and again on re-passing Port Louis to return to L'Orient. The demand is so frequent, that it is not safe for a person to go out and take a walk without a passport in his pocket. It seems in general to be considered as a mere measure of finance, a sort of export duty on every person leaving his home, but in this instance the farce was carried further than usual. Besides all the plants which we had found on the shore at Carnac, we gathered here *Silene conica, S. Otites,* with a shortened panicle (probably a near approach to the *var. umbellatum* of Duby), *Linum angustifolium, Euphorbia Portlandica, Ephedra distachya, Statice spathulata, Medicago striata? Cheiranthus sinuatus, Trichonema Bulbocodium, Triticum Nardus, Orobanche caryophyllacea, Festuca uniglumis,* and *Thesium Linophyllum.*

On the 12th we sauntered in the neighbourhood of L'Orient, and observed *Phalangium bicolor, Erica ciliaris* (the latter without any indications of flowering), *Juncus pygmæus, Antirrhinum Pelesserianum, Pinguicula Lusitanica,* a pink-coloured variety of *Anagallis arvensis,* and *Lobelia urens* not in flower. *Pinguicula Lusitanica* is perhaps the best example of a western plant, since it is said to be found at Tangiers, and extends through a great variety of climate to Cape Wrath; while its most easterly position is, I believe, in Hampshire. *Lobelia urens* occupies by no means the same extent from North to South, and reaches further to the East than the *Pinguicula* in the South of France. I do not know whether this or the *Scilla verna* is most limited in the range of its

longitude. *Scilla nutans* stretches much further to the eastward in Italy, France, and England, but is hardly found in Germany, and must probably be enumerated among the plants which prefer a position towards the western shores.

On the 13th we went to Quimper (pronounced Chimper by the Bretons); the aspect of the country is still that of a highland, intersected by narrow winding valleys, and seldom offering any extensive prospect; but the hills get loftier and bolder as we advance, and towards Quimper begin to separate a little, leaving a wider bottom, so that our approach to this town offered some fine views, reaching in one or two directions to a considerable distance. There is a good deal of wood, and trees of a large size; and the fields are generally enclosed with trees in the hedge-rows. I had figured to myself in Brittany a country of extensive heaths and wide unsheltered wastes; but this is by no means the case in those parts I have visited. There is, it is true, a great deal of land covered with *Ulex Europæus,* but it is usually enclosed, the plant appearing to be cultivated for fuel and manure, as the farm-yards and adjoining lanes are often strewed with it. In some districts, also, they bruise the young shoots for early fodder, of which the cattle, and especially horses, are said to be very fond. I have heard Brittany described as dry, but it abounds in springs and bright little streams. Quimperlé and Quimper are both placed in narrow valleys at the junction of two small rivers. I could not learn whether the name indicated such a situation. Quimper had, a few years ago, a Botanist of the name of Bonnemaison, and his successor in a druggist's shop, a Mons. Bourassin, was pointed out to me as the Naturalist of the place. I took the liberty of calling upon him, but found that his attention had been almost wholly directed towards Geology. He represented the hills on both sides of the valley of the Aulne as the most interesting parts of the province; but this was rather in a mineralogical than in a botanical point of view; and Plougastel, where there was a transition limestone. He thought, too, we might find something at Douarnène. To the latter place we went, and found the shores of the bay extremely beautiful; but the plants were only such as are very general throughout Brittany. *Asplenium lanceolatum* and *marinum, Lotus hispidus, Orchis laxiflora, Erica ciliaris, Campanula hederacea, Illecebrum verticillatum, Sibthorpia Europæa, Lycopodium inundatum, Daucus maritimus, Scirpus Savii, Verbascum virgatum,* and *Erodium maritimum.*

On the 16th we went to Briec and ascended the rocky point of one of the slaty hills, pointed out by M. Bourassin, without adding any thing to our list of Breton plants, except *Drosera Anglica* in one spot, but not yet in flower. On the moist hedge-banks we observed *Sibthorpia Europæa, Campanula hederacea,* and *Lysimachia Nemorum.* On the heaths grew *Lobelia urens, Erica ciliaris,* and *Agrostis setacea;* in springy ground, *Carex biligularis* and *pulicaris;* and among the corn was *Lapsana minima.* But if our botanical harvest was not very rich, we were gratified by a splendid display of Breton costume, as there was a fête in the village. In various parts of France we find a marked variety in the female dress, especially about the head; while that of the men is nearly alike. Here, however, the dress of the men is very different from what one meets with elsewhere, and the outer jacket, which is shorter than the inner one, seems to be modelled on the flowers of the *Datura Stramonium.* Both garments are light blue; but the girdle, which is placed almost at the bottom of the inner one, and below the hips, seems to be of gilt leather. The full breeches are often white.

On the 17th we set off for Brest, at half past seven in the evening, and saw, of course, but little of the road. We visited the Botanic Garden, and found the gardener, Mons. Plougam, very modest and unpretending, with a good deal of botanical science. His situation obliges him chiefly to direct his attention to cultivated plants, but he is, nevertheless, a zealous investigator of native Botany, and knows more of

the plants of Brittany than any one I had met with since leaving Nantes. He conducted me to a bog at Bodonou, the only station in the country for *Myrica Gale;* but I was not very well, and hardly thought my botanical success in finding the

"Scented Myrtle of the bog,"

which is so common at home, a sufficient recompence for a walk of thirteen or fourteen miles. The plants were *Verbascum virgatum, Erodium maritimum, Briza minor, Tormentilla reptans,* and *Lobelia urens,* near Brest; *Isnardia palustris, Illecebrum verticillatum, Cladium Mariscus, Ranunculus tripartitus,* and *Pilularia globulifera* in the bog. A pleasanter walk, and more interesting Botany, we had found the day before, along the shore of this beautiful and magnificent gulf.

The harbour of Brest passes entirely through the town, dividing it into two parts, without any connecting bridge; we passed it by a ferry, and ascending a fine open spot beyond the walls obtained a glorious view of the fine expanse of water and the varied hills which bound it, and shortly descended to a road along its banks. We observed abundance of *Lotus hispidus* and *angustissimus,* two plants which appear to me perfectly distinct, though apparently confounded by some of our English Botanists. The latter is the one described in the *English Flora,* and has been gathered at Hastings, and in Devonshire; but the specimens which I have myself found in that county belong to *L. hispidus.* This name is bad, since the plant is not hispid, but clothed with soft hairs. *L. pilosissimus* of Poiret I do not know; and it would seem to be in some respects intermediate. The only tangible difference in the description between this and *L. hispidus,* consists in the *Leguminibus compressis punctatis* of the latter, as opposed to the *Leguminibus subteretibus glabris* of the former. Yet the epithet *punctatus* does not seem to be correctly opposed to *glaber,* and *subteres* cannot be very different, one would suppose, from *compressus.* De Candolle does not appear to have seen the plant in any state, and suspects, probably with justice, that it is only a variety of *L. hispidus.* The other plants were *Silene Gallica, Linum angustifolium, Ornithopus ebracteatus, Polycarpon tetraphyllum, Gnaphalium Gallicum, Bartsia viscosa, Trichonema Columnæ, Juncus capitatus, Cynosurus echinatus,* and *Lolium multiflorum. Scilla verna,* as we afterwards learned, grows at the top of the bank which slopes down to the water's edge, but we did not observe it.

On the 22nd we engaged a cabriolet to Le Conquet, a wild and rugged shore; but the opposite point of the bay, which I conclude from the map to be near Camaret, seemed much more so, and would be worth a visit. There are, on this western extremity of France, considerable remains of a large church, which add greatly to the picturesque effect of the scene. The plants were *Daucus hispidus* (probably, but it is almost impossible to determine the species of this genus), *Galium arenarium,* with white flowers, which, however, become yellowish in drying, and *Linum angustifolium,* with purple flowers, *Inula crithmoides, Frankenia lævis, Salsola fruticosa, Trichonema Columnæ,* and a variety of *Thrincia hirta,* with a hairy scape and calyx. This is what Desvaux considers as the *T. hispida* of De Candolle; but it wants the most important part of the character of that species, a calyx without any outer scales. The next day we proceeded in the diligence to Landerneau, getting out by the way about two leagues (called one league) from the latter place, to look for *Cistus hirsutus* near the village of Pontarvelin. This is an interesting locality, as there is no other true *Cistus* so far North; the *Cistus salviæfolius,* which makes the nearest approach, producing its last specimens not far from Saintes: then, again, this is a Spanish plant, not elsewhere found in France: it grows abundantly among the furze, in fields immediately above the branch of Brest harbour, between Pontarvelin and Landerneau, extending for about a quarter of a mile along the shore, seeming to require the protection which the

furze affords it, and cultivation has of late evidently been trespassing on its boundaries, and diminishing its quantity. Why it should have fixed itself there, and there alone, if an original native, or by what accident it could have been introduced and disseminated, are problems which I cannot solve. The soil is a crumbling gneiss, or perhaps a sandy rock, with a slaty structure, whose easy disintegration is shown in the deep sandy lanes along which we passed in descending from the high road to the shore. Our further walk to Landerneau was enlivened by the fires lighted in honour of St. John's Eve, on various elevated points. A large one was placed in the middle of the high road, about half a mile from Landerneau. We had been told of certain superstitious ceremonies attending these fires, but the only thing we saw which could possibly come under such a denomination, was the endeavour to touch the fire with the shoots of a plant, (I believe of *Sedum Telephium*,) which are said to be afterwards preserved, but for what purpose our informant could not tell us.

On the 24th we went to St. Pol de Léon (the Ligis of Duby). There is a picturesque fragment of a castle a little way from Landerneau, and at Landivisiau we again met with some curious costumes, the most striking difference being, perhaps, the dark chocolate colour of the whole dress, instead of the light blue and white of Briec. The belt is placed higher up, and the lower part of the cylindrical waistcoat divided into flaps. At St. Pol we saw nothing remarkable, though it is noted in the books as the place where the ancient Bréton manners are most preserved. We walked on the shore of the creek in the afternoon, and to Roscoffe on the point of the promontory, the next day. The whole sea is studded with pointed rocks, forming islands at low water, and some of them at high tide. Similar rocks crowned many of the little hills of the shore, and among these were some we might have fancied to be druidical monuments, if those at sea had not been so evidently of the same nature. There is a considerable extent of sand-hills West of Roscoffe, and there we found *Galium arenarium*, *Linaria arenaria*, *Carex extensa*, and *Festuca uniglumis*. Our walks also yielded *Medicago apiculata?* *Orobanche cærulea*, *Lamium dissectum*, *Papaver hybridum*, *Erodium maritimum* and *E. moschatum*, *Trichonema Columnæ*, *Sibthorpia Europæa*, and *Silene Gallica*.

On the 25th we came to Morlaix, and on a piece of rough ground at a very short distance S. W. of the town, found an *Erythræa*, which appears not to have been noticed. Its characteristics are the diffuse mode of growth without any indication of a leading stem, and the few flowers, not above two or three in a panicle. This did not arise from late shoots, as the *Erythræa* had hardly yet begun to flower, and this may be considered as one of the earliest; nor had it been eaten by cattle, for most of it was well protected by the prickles of the *Ulex* among which it grew nor was it owing to that shelter, for some of it was in open and exposed situations. In all, the appearance was alike, and I should propose to call it *Erythræa diffusa*;[1] *caulibus diffusis-subbifloris*.

The subulate divisions of the calyx afford here no character, being sometimes quite as long as the tube of the corolla, and sometimes considerably shorter. I find a specimen of this species in the Herbarium of Sir J. E. Smith, from the Azores, with a memorandum in the hand-writing of Sir J. E., that it is the *Chironia maritima* of the *Hortus Kewensis*, but not of Willdenow; the description of *C. maritima* in that work is, however, by no means such as would identify the plant, and the prin-

[1] This proves, on the authority of Dr. Griesbach, who has so deeply studied the *Gentianeæ*, and to whom I sent specimens, to be a most highly interesting plant, unnoticed by all Botanists since the time of the younger Linnæus, who described it very imperfectly in the Suppl. under the name of *Gentiana scilloides*, a native of the Azores, and found by Masson, as quoted by Linn. fil.; yet Sir James Smith (according to the memorandum quoted by Mr. Woods) did not seem to be aware that Masson's Azores plant was the *Gentiana scilloides* of Linn. Suppl. Of course the name here given to it by Mr. Woods is infinitely to be preferred, and we intend shortly, with the permission of its discoverer, to give a figure of the species. Ed.

cipal reason for supposing it to be intended for the same is, that it is stated to have been introduced from the Azores by F. Masson. The flowers are red.

My friend and companion left me at Morlaix, but I returned westward, thinking that I had not yet done justice to Brittany. On the 27th I walked about Landerneau, where I gathered *Carex biligularis*, *Fumaria claviculata*, *Tormentilla reptans*, and *Hymenophyllum Tonbridgense*, all nearly close to the town. The views up the valley of the little river on which the town stands are very pleasant, but the finest are towards the harbour of Brest.

On the 24th I went to Plougastel, which, from the guide-books, and the information I had obtained concerning the nature of the rock, I fondly imagined to be a Bréton Cheddar. I found the limestone to consist of a few small beds, subordinate to the slaty rock, which did not give birth to a single characteristic plant, and the rocks had some bold crests, which had formed a fine object from the opposite shore of Pontarvelin, but were not worth a visit on their own account. The views from hereabouts over Brest harbour are glorious and highly varied. We walked in many places through extensive fields of strawberries, and there is in the church-yard, perhaps, the most curious cross in Brittany. The basement is adorned with two stories of figures sculptured in granite, representing the principal events of our Saviour's life. These are the real objects of curiosity at Plougastel. The road from Landerneau to Plougastel is detestable; I could not say there were ruts, for a rut implies a comparatively even surface, on which it may be traced, but there were deep tracks worn among the rocks, and occasionally the mark of a wheel. My driver had the prudence to get out and lead his horse at all difficult places, but on returning, when we were in a better road close to Landerneau, he overturned me. I escaped with a few trifling bruises; but his wife, whom he had requested permission to put into the cabriolet, in order that she might visit a child at nurse, suffered more severely. However, he introduced me to her bedside next morning, and there seemed to be no apprehension of any serious evil. The rarest plants of the day were *Salicornia radicans*, *Lobelia urens*, *Helianthemum guttatum*, *Scrophularia Scorodonia*, *Mentha rotundifolia*, and *Galeopsis versicolor*.

On the 29th I returned in the diligence to Quimper. As a large portion of those who make use of a French diligence are commercial travellers, who want to stop at a great many towns, one who has taken the precaution to be early on the list, will be rarely disappointed of a place. The road lies high, but has to cross some very deep valleys, of which the descents are very steep. At Le Faon I observed a wooded range of hills, at a short distance, which I thought I could have explored with pleasure, but at Chateaulin the ground is more broken and varied, and the hills higher and wilder, and altogether this spot would, I think, have been well worth a day or two. On a former occasion I had passed it in the dark, and saw nothing.

On the 30th I walked down the left bank of the river at Quimper, observing *Oxalis stricta*, *Sagina maritima*, *Campanula Rapunculus*, and *Poa procumbens*. The *Crepis* begins now to form its seeds, and consequently to deserve the attention of a person who is obliged to confess that he does not know the species. All that I find here seem to be the *C. virens* of De Candolle, which, as the character is given in Duby, might well include both *C. diffusa* and *C. stricta*; "*foliis lanceolato-runcinatis*," is an expression of Linnæus. It however conveys to me no distinct idea, and I hardly know whether to consider it as equivalent to "*foliis lanceolatis runcinatis*." This is opposed to the "*foliis remote dentatis sinuatis runcinatisve*," of *C. diffusa*, and the *foliis runcinato-pinnatifidis* of *C. stricta*—other difference there seems to be none, and a person accustomed to observe the great variety of the leaves in what we usually in England call *Crepis tectorum*, will not, perhaps, attach any great importance to such characters. *C. diffusa* and *C. stricta* differ from

each other in their upright or diffuse stems; but as nothing is said of this in *C. virens*, we may suppose it to vary in that respect. Desvaux cites the *C. diffusa* of De Candolle as a synonym of *C. virens*, and assigns to it pinnatifid root-leaves. Of *C. stricta*, though he quotes De Candolle, he says that his plant differs from the one of that author, without stating in what respects. He gives, however, what may be a very good guiding character, though not a specific difference, that the rays are yellow on both sides, and not reddish externally. Yet I find this sometimes in *Crepis virens* at Lewes. To his *C. Dioscoridis* he cites *C. virens* of De Candolle, of which the stem is bristly (*herissé*) at the base. As the plant occurs in Brittany, it is often hairy at the base; but I never saw it bristly. *C. scabra* I do not know.

After my walk I went to the public library, which is open every day except those of fêtes, from twelve to four, in order to examine the Herbarium of Mons. Bonnemaison. It is in great confusion, and it seems as if nothing could be learned from it without a detailed examination of the whole. A large portion consists of *Algæ*, to which he had paid particular attention; they are from all parts of the world, but arranged (so far as there is any arrangement) according to an unknown system of his own. The manuscript, however, is said to be in existence, but is not in the library. The other packets which I opened were principally, but not exclusively, plants of Brittany, or of France. I observed *Andræa alpina*, which is merely said to grow on rocks and stones, but there are Bréton habitats for *A. Rothii* and *A. rupestris*. Among the bundles of flowering plants which I hit upon, there was one containing the twenty-first, twenty-second, and twenty-third classes of Linnæus, with the addition of the Ferns. This contained *Ophioglossum Lusitanicum*, from the Isle of Ouessant, *Grammitis leptophylla* from Brest, St. Pol, and Pourviers; *Urtica membranacea* from Pourviers, and *U. pilulifera* from Le Conquet. In the afternoon I went to Pont L'Abbé, and the next morning to Penmark. "It is a beautiful country," said my landlady of the Bras d'or, at Pont L'Abbé, "one wide extent of corn, without hill or hollow." I thought this was not what I came to see on the representation of the guide-books, which describe wild and magnificent scenery; but it was nearly correct, except that she omitted the pools of water, the barren depressions, and the naked sands of the sea-shore. The whole rocky foundation of the country slopes almost insensibly into the sea, and the slight bank made by the action of the waves on the covering of a looser soil, is the only mark to separate the long extent of naked rock exposed to its action from the cultivated land. The principal sand-hills are on the North-west, and there I found, in addition to what I every where meet with on these spots, *Astragalus Bayonensis*, and *Spergula subulata*—*Atriplex laciniata* is also plentiful. There are also sand-hills to the South-East, and in the part between them, including the extreme point and the light-house, I found *Crypsis alopecuroides*, but not in flower, *Poa procumbens*, and a specimen of *Phalaris aquatica*. Here were also *Polygonum maritimum* and *P. Raii*, *Chenopodium glaucum*, *Œnanthe pimpinelloides*, and *Diotis candidissima*. Other plants observed were, *Kentrophyllum lanatum*, *Juncus pygmæus*, *Verbascum virgatum*, *Carex distans* and *extensa*, and *Polypogon Monspeliensis*. On my return, I left my cabriolet about seven miles from Quimper, and had a pleasant walk, passing over a fine open hill, with marks of entrenchments, whence I had a noble view. *Lobelia urens* grew every where and was at this time in full flower; *Asplenium lanceolatum*, *Monotropa Hypopithys* in a hedge, *Osmunda regalis*, *Illecebrum verticillatum*, *Lapsana minima*, and *Hypochæris glabra*.

On the 3rd, in a short, but delightful walk up the valley of the western stream, I added to the plants of the neighbourhood of Quimper, *Agrostis setacea*, *Fumaria claviculata*, and a *Potamogeton*, which is, I think, the *variifolium* of Thore.

On the 4th I went to Concarneau, and

was much disappointed in finding, not only that there was no diligence thence to Quimperté, but that there was no carriage in the place which I could hire, nor means of sending my luggage, had I walked or ridden on horseback. The inn was dirty, and the people very careless. My first walk was along the shore northward, where nothing occurred but what grows every where on the southern coast of Brittany, except *Allium sphærocephalum;* but I was struck with the close neighbourhood of *Osmunda regalis*, and *Asplenium marinum. Cynodon Dactylon* showed here some blighted spikes. The next excursion was across the Ferry to the southward, where I observed, in addition, *Corrigiola littoralis, Illecebrum verticillatum, Euphorbia Peplis* and *Portlandica, Brassica Cheiranthus, Polycarpon tetraphyllon, Galium arenarium* (a very large *var.* with white flowers), *Plantago lanceolata (villosissima), Asphodelus albus, Brachypodium pinnatum, Inula pulicaria, Juncus Tenageya, Littorella lacustris, Exacum filiforme, Erica ciliaris* (in flower for the first time), *Lythrum hyssopifolium*, and *Bupleurum Odontites.*

On the 6th I returned to Quimper, and walked to a bog four miles distant, which I had noticed on the road. Appearances were promising, but the only rare plant was *Utricularia minor.* The others were *Illecebrum verticillatum, Utriculària vulgaris, Osmunda regalis* in very great abundance, *Carex ampullacea, Veronica scutellata*, and *Galeopsis versicolor.*

On the 7th I again returned to the Herbarium of Mons. Bonnemaison. The packet examined this time contained *Syngenesia superflua*, the *Rubiaceæ, Dipsaceæ, Valerianeæ*, and *Caprifoliæ.* Very few of these were plants of Brittany, and the only habitat I obtained was on a specimen marked *Anthemis mixta*, but which appeared to me to be *A. Cota, "dans le Verger prés le temple des faux Dieux;"* most of the samples were in very bad condition. In the evening I proceeded to L'Orient, arriving there at two in the morning.

On the 8th I walked to some landes on the shore of a creek, where I had before botanized with Janson. *Erica ciliaris* and *Lobelia urens* are now in flower, and *Exacum filiforme* has sprung up in the wet places; *Scirpus Savii, Statice spathulata*, and a *var.* of *S. Limonium*,—a small-flowered variety of *E. Centaurium* was also abundant.

On the 9th I went again to Port Louis, adding to the plants formerly observed there, *Gnaphalium Stæchas, Polypogon Monspeliense, Allium sphærocephalum* (not sufficiently advanced on the former occasion to be identified), *Triglochin Barrelieri* and *Salsola fruticosa, Salicornia radicans* and *fruticosa, Thesium linophyllum, Rottbollia incurva*, and *Bupleurum Odontites.*

The next evening I set off in the diligence to Plélau, on the road to Rennes, and had for my only companion in the coupé a talkative Bréton noble, who was going to Rennes on some law business, and cited to me a French proverb, *"qui a terre, a guerre,"* which seems to indicate that the intricacies of title-deeds are as great in France as in England. This gentleman gave me a sort of history of his life. He had entered into the army under Louis XVI, and afterwards, if I understood him right, had endeavoured to support the royal cause in the Vendeé. At a later period he was Colonel of Cavalry in the army of Napoléon, and held the same rank under the restored Bourbons; but neither the one nor the other were so sensible of his merit as they ought to have been. He told me that circumstances had induced him to sell several of his farms, the tenants having almost always been the purchasers. He was very strenuous for the excellence of the Bréton language, which he identified with that of the Celts, and considered as one of the three original languages, whence all others have been derived. *"Ehrenbreitstein,"* for instance, which ignorant people have translated "the broad stone of honour," is composed of four Bréton words, meaning "the road of war is here closed."

My inducement to stop at Plélau was the neighbourhood of an extensive forest, and on the 18th I walked to the nearest part of it, lying beyond a little hamlet, called Le Guè, and traversed a variety of open heath, close wood, grove, and thicket, dry bank, and peaty bogs, among *Oaks* and *Birch*, *Pine* and *Alder*, without making any addition to the species I had already found in Brittany. *Erica ciliaris* and *Lobelia urens* grew in great abundance. There were also *Centunculus minimus*, *Exacum filiforme*, *Juncus Tenageya*, *Pyrus Aucuparia*, and the thorny variety of *P. communis*.

On the 12th I walked along the road by which I had come, for about three miles, as far as the little brook which separates the Department of the Morbihan from that of the Ille et Villaine, whose course I traced upwards for some distance, and this led me into a much wilder country than that of the previous day, among rocky ground and higher hills. The plants were in general the same, but I added *Galeopsis villosa*, *Vicia lutea* and *Lolium multiflorum* and *temulentum* among the corn; *Verbascum Blattaria*, *Juncus pygmæus*, *Illecebrum verticillatum*, and *Exacum filiforme* grew in the dry ditches which bound the road; *Hypericum linearifolium* abundantly among rocks and bushes on the East side of the valley. I was highly delighted with the latter, and though on consulting Desvaux, my transports were a good deal tranquillized by the expression "*plante assez commune*," I still value it as one of the great prizes of my journey. *Œnanthe apiifolia?* in the brook which I followed, seems to grow exclusively in the water; the involucrum is often wanting, and there is some difference in the general appearance, and in the shape of the leaves. How far these marks may suffice to distinguish it from *O. crocata*, I do not know—the yellow juice is alike wanting in both. *Myriophyllum alterniflorum* grows also in the brook, perhaps not differing specifically from *M. spicatum*; *Exacum Candollii* (I believe, for the description does not quite agree), was another good plant, which I found for the first and only time in my life, on the banks of the upper pond of the Iron Forge.

On the 13th I went to Rennes, and on the 14th to St. Malo. The *Lobelia urens* may exist in the country, but it is no longer so abundant as to be observable on the road-side, and *Verbascum virgatum* has given place to *V. pulverulentum*, which I had not before noticed since it came into flower, though I had observed the leaves of it at St. Nazaire, and I think it is either uncommon or not found in Finisterre. The packet sailed next morning, and not being willing to stay a week at St. Malo, I know nothing of its botanical productions.

We left St. Malo at half-past six A. M., on the 15th of July, and arrived at Jersey at half-past ten. The plants of this island have always been enumerated in the English Flora, which thus gave them additional interest with me, and as such many were worth observing and collecting, which in Brittany I should have passed over almost without notice. I gathered two plants on the shore at a very little distance from the town, which have not hitherto found a place in the English Flora, and thus my attention was greatly stimulated as to what the island might produce. I saw here *Trichonema Columnæ*. This, with the *Helianthemum guttatum*, grows in the greatest abundance on the top of the seaward slope of the hills beyond St. Brélade. The same situation affords *Juncus capitatus* and *Lotus hispidus*. *Schænus nigricans*, beyond St. Brélade's bay. *Scirpus tenuifolius*, St. Owen's Pond. *Knappia agrostidea*, on the sands. *Aira canescens*, sands of St. Brélade's Bay, and on the Quenvais. *Briza minor*, corn-fields, common. *Cynosurus echinatus*, on the hill on which Fort Regent is placed. *Festuca uniglumis*, common on the shore. *F. sabulicola*, undoubtedly the plant of the shore near Bordeaux, whether distinct or not from *F. rubra*. *Bromus diandrus* or *maximus?* on the shore East of the town. *Polycarpon tetraphyllum*, *Exacum filiforme*, very common in the West of Jersey. *Anchusa sempervirens*, about Granville. *Echium viola-*

ceum, shores; I did not observe any where the *E. vulgare*. *Herniaria glabra*, sands of St. Aubin's Bay. *Daucus maritimus;* the shining root-leaves, with broader segments, lying on the ground, make me conclude the plant of those shores to be the *D. maritimus* of the *British Flora*. Yet the root-leaves are often wanting, and as we trace it inland, the appearances are very ambiguous. The umbel of seeds is often flat, but sometimes hollow, even on the same plant. *Statice arenaria*, sands of St. Owen's and St. Brélade's Bays, and in the Quenvais. *S. spathulata*, rocks of the shore in several places. I saw no *S. Limonium*. *Allium sphærocephalum*, sands of St. Aubin's Bay in great abundance, along with *A. vineale*, from which it may be distinguished, without flowers, by the filiform stalks to which the offset-bulbs are attached. *Asparagus officinalis*, on the sea-slope of the hills among the furze beyond St. Brélade, where it seems to be quite wild, and where it had evidently borne flowers. *Juncus capitatus*, on the top of the slope, towards the sea beyond St. Brélade's Bay. *J. acutus*, sands near St. Owen's Pool. *Alisma ranunculoides* in several places. *Polygonum Raii?* sandy shores. *Silene conica*, sands of the hill West of St. Hélier and St. Owen's Bays; *S. nutans* and *S. Anglica* common. *Helianthemum guttatum*, the *Trichonema* and *Bartsia viscosa*, moist ground, common. *Scrophularia Scorodonia*, hedges in many places. *Sibthorpia Europæa*, below St. Saviour's. *Orobanche cærulea*, on sandy ground among the *Lucerne*, to the East of St. Hélier. *Teesdalia nudicaulis*, St. Brélade. *Lepidium Smithii*, St. Brélade. *Cheiranthus sinuatus*, sandy shores. *Brassica Cheiranthus*, shores of St. Aubin's Bay. *Trifolium strictum*, West of Jersey. *Lotus hispidus*, in several places. *L. angustissimus*, West of Jersey. *Euphorbia Portlandica*, sandy shores. *E. Peplis*, sands of St. Owen's Bay. *Atriplex laciniata*, sandy shores, abundant. *Asplenium lanceolatum*, West of Jersey.

On the 27th I visited the National School, where I had the pleasure to find that the boys answered very well. The clergymen of the place seemed to take much interest in this institution. At a little before two I went on board the Sir Francis Drake, which was bound to Plymouth, and at half-past seven we arrived at Guernsey. There seems in this island more of level sand under water in the little bays, and less above the reach of the tide, than in Jersey. I gathered or observed in my walk of the following morning, *Trichonema Columnæ*, *Scirpus Savii*, *Cyperus longus*, *Polycarpon tetraphyllum*, *Linum angustifolium*, *Mentha rotundifolia*, *Bartsia viscosa*, *Scrophularia Scorodonia*, *Thlaspi Smithii*, *Raphanus maritimus?* *Erodium moschatum*, *Lotus hispidus*, *Euphorbia Portlandica*, and *Asplenium lanceolatum*, and at six in the evening left the islands in the Ariadne packet for Southampton, where we arrived a little after seven on the following morning.

Before concluding this notice, I will add some remarks on the inns and mode of travelling in Brittany, and of the sum required for such a tour. My whole expense was £48, during a tour of twelve weeks, or £4 per week. It is not necessary to bargain at the French inns—I do not say that a skilful cheapener might not sometimes save a few sous, which he might probably accomplish also in England, but in general the prices are more fixed and uniform than with us. The exceptions would, probably, be found in the English inns along the coast, some of which are very extravagant. But though the price of each apartment may be fixed, there are, at most of the hotels, rooms of different prices, according to their size, situation, and furniture, the usual charge for a good one being thirty sous per night. In many of the commercial hotels the chambers are all of one price, which I believe to be pretty uniformly twenty sous per night, but a Botanist requires some space and conveniences for examining, drying, and arranging his plants, and if I except the Hotel de l'Epée at Quimper, I do not recollect any where to have had a comfortable and conveniently-furnished room for that sum. In the vil-

lage inns, indeed, one rarely pays more, but when I say one may be perfectly comfortable in such places, it is to be understood that they are not measured exactly by the same standard, and that in point of furniture and appearance at least, we should not be contented with precisely the same accommodation in a town. In the larger cities, on the other hand, we must expect to pay two francs, or if occupying a chamber on the first floor, perhaps three. At the Hotel de France at Nantes, they demand three francs for all the front rooms, whether on the first or second story. In the South of France you usually pay more for apartments with boarded floors, but in Brittany all the floors are boarded. The practice of using the bed-chamber as a sitting-room, is perhaps not quite consonant to English prejudices, yet when accustomed to it, the traveller will find its advantages. His trunk being both his library and wardrobe, it is convenient to find these two requisites in the same place, and as the bed-rooms are provided with a writing-table, at least, or usually with a sécretaire, he has about him all that he wants. In England the bed-chambers are not furnished as sitting-rooms, and if the traveller engages a separate apartment, he feels it a sort of duty to spend considerably more than he otherwise would do, and at last may have the bed-room and sitting-room in different parts of the house.

The *Table d'hôte* is at a fixed price, varying in different hotels from two and a half to three francs, and in a few places on the great roads three and a half, or more, where they are calculated for the English traveller. In Brittany the wine is included in the price of the dinner. *Déjeuner à la fourchette* is about twenty sous less than the dinner, but of this I never partook, contenting myself in the morning with *Café au lait* with bread and butter, for which I usually paid twenty sous. At Nantes they charged twenty-two sous, at Quimper fifteen, and I have paid as low as twelve. Allowing, however, for a *déjeuner à la fourchette,* and thirty sous for the *café* taken after the dinner, and for some light refreshment in the evening, we may estimate the daily expense at eight francs per day. The servants expect to receive at least ten sous per day—I have usually given about fifteen, but varying from ten to twenty, according to the service performed; and this with washing, will bring up the charges to nine francs per day. Travelling in the coupé of a good diligence costs about twelve sous and a half a league (five shillings, or two-pence half-penny per mile), in the interior ten, including every thing. In the smaller voitures the price is lower. For a cabriolet it is necessary to make your bargain, for as they are hardly ever found at the inns, the owner knows he shall probably never see you again, and charges accordingly. The best way is to apply at the *Poste aux Chevaux,* where, if they demand a little more than you might obtain the cabriolet for elsewhere, still the overcharge is moderate, and made with some regard to reputation. For a cabriolet, the regular price paid by the town's-people is six francs per day, the person who hires driving and feeding the horse. With a driver, and the owner clearing all expenses, I have usually paid from eight to nine francs per diem, and from ten to fifteen sous over as a *pour boire* to the driver; but where there is no competition, you will not obtain it for this sum, and I have failed sometimes in offering twelve. The cabriolets obtained in this way all over France, are miserable vehicles; but in Brittany they are always on springs, and may serve for short distances.

Supposing, then, the traveller to make a round of three hundred leagues in a diligence, and to spend forty days on his tour, the expences will be—

	Fr.	So.
Forty days at nine francs per day	360	
Three hundred leagues at twelve and a half sous	187	10
Cabriolets for ten days	100	
Porters and occasional expenses and extra charge for luggage—say	52	10
	700—£28	

The travelling in England and crossing in the steam-packet would be in addition to this. The French steam-packets, which he might sometimes find, would save him something, but they are not often enough in the way to operate as any material reduction in the traveller's expenses.

The wildest parts of Brittany seem to be on the confines of the Departments of Finisterre and the Côtes du Nord, and of Finisterre and the Morbihan. I did not understand this till I was leaving the country, and the little success I met with at Briec rather tended to discourage me from turning my attention in that direction; yet if I were to revisit Brittany, I should be anxious to explore the neighbourhood of Le Faonet, of Chateau neuf du Faon, and of Carhaix, and the country between this and Morlaix. Here are extensive forests, abounding with wild boar and the larger game. Pontevy I should suppose also to be worth a visit.

I subjoin here a list of plants common in Brittany, which I have seen far more frequently than I have thought it necessary to mention; and another of species which are said to grow there, but which I did not meet with.

Plants common in Brittany, and which I have consequently noticed only where I first observed them:—

Ranunculus parviflorus. Lepidium Smithii, almost to the exclusion of *L. campestre*, which I did not see, and Mr. Plougam of Brest was the only Botanist I met with who knew the two species. *Iberis nudicaulis. Senebiera didyma. Cochlearia Danica*, every where near the sea. *Brassica Cheiranthus. Silene nutans. S. Gallica. Viola lactea*, this is the *V. lancifolia* of Thore; it is included by Duby under *V. pumila*, and is probably the *V. Ruppii* of Allioni, which is inserted by Gaudin with *V. montana. Helianthemum guttatum. Linum angustifolium. Oxalis corniculata, Lotus hispidus, L. angustissimus, Lathyrus Aphaca, Polycarpon tetraphyllum, Pyrus communis (spinosa), Cotyledon Umbilicus, Eryngium campestre, Carum verticillatum, Galium arenarium, Fedia carinata, Carduus tuberosus (bulbosus), Scorzonera angustifolia, Lapsana minima.* This latter is a *Lapsana* merely in artificial character; it has no general resemblance to *L. communis. Hypochæris glabra, Lobelia urens, Campanula Rapunculus, C. hederacea, Erica ciliaris, Linaria repens*, or *striata, Scrophularia Scorodonia, Veronica acinifolia, Sibthorpia Europæa, Bartsia viscosa, Mentha rotundifolia, Alisma natans, Orchis laxiflora, Carex biligularis, Agrostis setacea, Knappia agrostidea;* I saw this grass frequently, as long as the season promised; and, even to the end of my tour, I was able to distinguish it occasionally in the sands of the sea-shore. There was no reason for altering the specific name of this plant; but as I am unwilling to multiply synonyms, I have here adopted the name used by Smith. *Cynodon Dactylon, Briza minor, Festuca sabulicola*, on all sandy shores; *Triticum loliaceum*, shore; *T. junceum*, shore; *Osmunda regalis, Scolopendrium Ceterach, Asplenium lanceolatum.*

Plants said to grow in Brittany, which I did not find:—

Isopyrum thalictroides, wood near Nantes; *Barbarea præcox*, "in pratis subsalsis maritimis *Armoraciæ*." I observed this in several places among the corn; but in the above-named station, which would seem to indicate a genuine native, I did not see it. *Thlaspi alliaceum.* This is probably a mistake. I do not know the original authority for the habitat; but it may have been a Mons. Bonami, who published a "List of the plants in the neighbourhood of Nantes," not much to be depended upon. *Raphanus maritimus*, between Brest and Quimper. A wide station, especially if we follow the shore, which the nature of the plant renders it probable that we ought to do. We observed in several places near the shore, a large *Raphanus*, and several of the plants not in flower had some of the leaves "*interrupte pinnata.*" The prismatic form of the dried seed-vessel may be equally observed in *R. Raphanistrum*, where the silique has been gathered at its full size, but unripe. *Silene*

clandestina, "Gallia occidentalis." This expression ought to include Brittany, which however I suspect it usually does not. I have gathered *S. clandestina* on the Cevennes, but could not hear of it in Brittany. *Elatine Hydropiper,* shores of the Loire. *E. hexandra, Spergula saginoides,* "Gallia occidentalis." *Lavatera arborea,* "Belle Isle." This is the only properly French habitat; but I did not visit any of these islands. The intercourse with the shore seems to be merely accidental, and though it must be frequent, I do not know to what place the boats from any of these islands usually come. *Medicago apiculata,* "Gallia occidentalis." I perhaps found this at St. Pol de Léon, but I could not satisfy myself. *Potentilla supina,* "In glareosis Galliæ Boreali-occidentalis." I doubt if even this expression applies to Brittany. *Peucedanum montanum,* (which is our *Selinum palustre,*) N. and W. of France. *Artemisia crithmifolia,* said to grow near Nantes. *Carthamus mitissimus,* West of France. *Xeranthemum annuum,* West of France. *Thrincia hispida,* in the western provinces of France. *Leontodon hastile,* moist pastures in the West of France. I have found this near Bordeaux. *Chironia occidentalis,* with yellow flowers, perhaps a *variety* of *C. maritima.* It is said to grow from Bayonne to Brittany. *Exacum Candollii* and *E. pusillum:* both these are said to inhabit the shores left by the Loire in the neighbourhood of Nantes. *Lithospermum prostratum,* in *Armoracia extremâ.* I could find nobody who had even heard of such a plant. *Anchusa angustifolia,* West of France. *Linaria saxatilis,* shores of Brittany. I could gain no intelligence of it. *Lindernia pyxidaria,* "*In paludibus spongiosis inundatis Gallia occidentalis.*" *Bartsia bicolor,* on the sandy shores of the Isle of Ré, of Vindeles, and of Brittany. *Betonica incana,* woods about Nantes. *Salsola Tragus,* Nantes. *Atriplex prostrata,* shores of the N. W. of France. No information could be obtained respecting it. Is it a *maritime variety* of *A. patula?* *Amaryllis lutea,* Isle of Noirmoutiers. *Narcissus biflorus,* meadows in Brittany. *N. calathinus,* in the Isle of Glenau. This is a small island on the South coast. *N. odorus,* meadows in the West of France. *Allium intermedium,* "*In agris et aridis*" of the western provinces. *A. pallens,* "*In collibus et cultis* of the western provinces."

DESCRIPTION OF SOME NEW CISTACEÆ,

Chiefly found by Mr. Drummond, in the southernmost regions of North America.

By E. Spach.

(Communicated by the Author.)

LECHEA. *Nob.*

(*Lecheæ* species auctorum: charactere manco.)

Calyx persistens, accrescens, profunde 5-partitus, supra basin suburceolatus; *sepala* 2-seriata: 2 exteriora minima, plana, sublinearia, æstivatione subdistantia; 3 interiora multo latiora, navicularia, dorso subcarinata, æstivatione et post anthesin imbricata, nunquam contorta. *Receptaculum* in thecaphorum breve stipiteforme productum. *Discus* inconspicuus. *Petala* 3, stipitis basi inserta! cum sepalis internis alternantia, subpersistentia, angusta, exunguiculata. *Stamina* stipitis apice inserta, tarde decidua persistentia, sæpissime 3, petalis anteposita, raro 4—12. *Filamenta* libera capillaria. *Antheræ* subrotundæ v. ellipticæ, minimæ, dithecæ, basi affixæ innatæ, apice emarginatæ; connectivum angustissimum. *Ovarium* minimum, subglobosum, incomplete 3-loculare; dissepimenta ex endocarpio ad cavitatis centrum fere producta; *placentæ* 3 biovulatæ, tenues, subrotundæ, ovarii diametro subæquilatæ, inter se liberæ, media linea dorsali dissepimenti oppositi margine anteriori adnatæ, utrinque recurvæ, *funiculi* brevissimi, filiformes, adscendentes, basi faciei posterioris placentarum ad angulum centralem utrinque solitares; *ovula* orthotropa (primina secundina e nucleo haud ægre dignoscendis) arrecta, oblonga, basi affixa. *Stylus* deciduus, rectus, erectus, brevissi-

mus, filiformis. *Stigmata* 3,[1] laciniato-multipartita. *Capsula* minuta, calyce tecta, testaceo-cartilaginea, lævigata, obscure pellucida, incomplete 3-locularis, v. demum 1-locularis, ab apice ad basin loculicido-trivalvis (v. nonnunquam basi evalvis), abortu 3-sperma; valvæ sepalis interioribus antepositæ! conniventes, persistentes, dissepimenta aut incomplete superstitia, tenerrima (ovulorum incremento mox a placentis disrupta) aut subcartilaginea persistentia; placentæ 3 subcentrales, persistentes, demum liberæ, subcrustaceæ, tenuissimæ, fragiles, subrotundæ, subconduplicatæ; singulæ semen unicum amplectentes, ovulo abortivo hinc superstite. *Semina* minuta, valvis subæquilonga, ovato-trigona (facie angulata, dorso convexa) lævigata, obscure pellucida, arrecta, orthotropa, ad basin faciei posterioris cujusvis placentæ funiculo brevi capillari adscendente affixa, decidua; integumentum tenue, crustaceum; micropylus terminalis, vix conspicuus; hilum cum chalaza in areolam parvam basilarem confluens, perispermium corneum; embryo axilis, antitropus, rectilineus v. subrectilineus, perispermio subæquilongus; cotyledones planiusculæ, subfoliaceæ, ellipticæ, fere æquilatæ; radicula recta v. oblique erecta, supera, cylindrica, obtusa,cotyledonibus subæquilonga.—Fruticuli, *sæpe surculis radicalibus decumbentibus gaudentes aut* herbæ. Folia *exstipulata, integerrima, breve petiolata: inferiora verticillata v. opposita; cætera sparsa.* Ramuli *floriferi axillares v. subterminales simplicissimi, v. bifurcati, v. paniculati, nudi, v. bracteolati; pedicelli in racemulos sæpissime unilaterales dispositi, v. rarius fasciculati, aut paniculati, post anthesin erecti v. raro horizontales.* Flores *minimi, copiosissimi.*

[1] We conceive Dr. Lindley to have taken a wrong view of the matter, in characterizing *Cistaceæ* by a "simple stigma;" all the species of the Order which are not provided with multipartite, or totally distinct, stigmas, having a stigma composed of plicate or fimbriolated fleshy crests; these crests are sometimes connected by their margins, and more or less connivent, but never entirely cohering; in all cases they may be easily separated, and each of them ascertained to terminate one of the constituent parts of the apparently single style, which parts themselves may be without difficulty disjoined and followed down to the axis of the placentæ. Several promoters of imaginary theories have asserted, that styles or stigmas placed opposite the placentæ (or, to use a more appropriate term, in axile relation to the placentæ) were to be reckoned among the most anomalous occurrences; such is, nevertheless, the situation of the styles or stigmas with respect to the placentæ, not alone in *Cistaceæ*, but also in most cases of loculicidal dehiscence. In fruits with intervalvular placentæ, the axile situation of the stigmas with regard to the placentæ, is no way peculiar to *Cruciferæ*, though this has been stated by Dr. Lindley to be one of the most striking characters of the Order, since the same relation is observable in *Papaver* and *Meconopsis*, whereas in *Cruciferæ* several genera (viz. *Hesperis, Malcolmia, Matthiola, Chorispora, Moricandia*, and probably some others) have their stigmas in a direct line with the axis of the valves, and consequently alternate with the placentæ. It must be remarked, that the style of these *Cruciferæ* has generally been mistaken for true stigmas.

Dr. Lindley seems almost equally in error with most of his other statements concerning what he considers the essential characters of *Cistaceæ*. The petals of this Order are far from being generally "crumpled and twisted" in æstivation, neither are they always fugitive, nor in quinary number. A strictly definite number of stamens is found in *Lechea, Lechidium, Tæniostema*, and *Heteromeris*. *Anatropous ovules* (and consequently not inverted embryos) are met with in *Cistaceæ*, though much less frequently than orthrotropous ovules: the *ozostoma* being, in all possible cases, situated on the true apex of the ovule. It is not easy to understand what is meant by "ovules with the foramen on their apex;" if this signifies the apex with respect to the pericarp, it is inapplicable to the various *Cistaceæ* with inverted ovules. Equally erroneous is it to describe the capsule as "either one-celled, with parietal placentæ, or imperfectly five or ten-celled, with dissepiments proceeding from the middle of the valves, and touching each other in the centre," there being many species with imperfectly three-celled capsules, whose placentas never touch each other in the centre, either before or after impregnation. The same may be said of *Androsæmum*, and a great number of other *Hypericaceæ*, which are imagined to be characterized by *central placentæ*. The seeds of *Cistaceæ* are, indeed, of indefinite number in many instances, and in nearly as many others the ovules are almost constantly in one, two, or three pairs on each placenta, and monospermous placentas are not at all uncommon. The perisperm, which Dr. Lindley calls mealy, is as often corneous. The embryo, in several cases, is exactly rectilinear, a conformation which has been noticed by M. Dunal, but is nowhere mentioned by Dr. Lindley. Finally, it may be remarked with regard to his alliance of *Cistales*, that regular flowers and perispermous seeds, upon which are founded its characters, might seem a very slight link for connecting *Elatinaceæ* (an imaginary Order, whose supposed character of a *straight embryo* is weakened by the nearly circular embryo of *Elatine Hydropiper, Reich.*), *Linaceæ, Hugoniaceæ, Chlenaceæ, Cistaceæ*, and *Beaumuriaceæ*.

This genus, together with *Lechidium* (nob.) *Tæniostema* (nob.) and *Heteromeris* approach very near to *Portulaceæ*, in whose vicinity the *Cistaceæ* should be classed in a Natural Arrangement of Plants. The systematic Botanists will, no doubt, consider such an opinion as a great heresy, and avail themselves of the supposed difference of insertion; but even this worn-out argument will not prove of weight, since many *Portulaceæ* (among which I need but cite the *Claytoniæ* and the genus *Cistanthe*, nob.) have stamens as strictly hypogynous as any *Cistaceæ*. There are, I believe, no other constant differential characters between *Cistaceæ* and *Portulaceæ*, than those found in the conformation of the anthers and of the ovules; the anthers of *Cistaceæ* being always adnate or innate, whereas, in *Portulaceæ*, they are incumbent. The ovules and seeds of nearly all *Cistaceæ* are orthotropous (the embryo consequently antitropous) or in a few cases anatropous,[1] but in *Portulaceæ* these same organs are constantly campylotropous. Concerning *Cistaceæ*, this statement rests upon a careful examination of nearly all the species; but as to *Portulaceæ*, it is founded rather upon the descriptions of various authors than upon my own observations.

Besides the two new species to be hereafter described, the generic character, as I have stated it above, applies also to *Lechea villosa* (Elliott) and *Lechea thymifolia*, (Mich.)

LECHEA DRUMMONDII. (*nob.*)

L. *Drummondii*, suffruticosa, surculis radicalibus filiformibus procumbentibus pilosis, caulibus erectis virgatis appresso-puberulis, apice paniculatis, foliis (surculorum) verticillatis ternis quaternisve breve petiolatis ovatis v. ellipticis acuminulatis ciliatis reticulato-venosis utrinque glabris resinoso-punctulatis, ramulis fructiferis paniculatis v. subcymosis, pedicellis erectis brevibus ebracteolatis, sepalis interioribus mucronatis capsula ellipsoidea trigona infra medium evalvi paulo brevioribus.

Root perpendicular, subligneous, about the size of a hen's quill, scarcely more than an inch long, emitting along its principal stem some slender fibres, and from near its summit a tuft of sterile, decumbent or assurgent, filiform, simple, leafy branchlets, which are clothed with short, roughish, white, somewhat diverging hairs. *Stems* several, fifteen to eighteen inches high, quite erect, slender, virgate, suffruticose, quite simple along their inferior half, or higher up, then emitting numerous very slender paniculate branchlets, which are disposed in an elongated panicle, and slightly pubescent, as well as the main stem; *bark* smooth and shining, chestnut-brown. *Leaves* of the radical branchlets ternate or quaternato-verticillate, petiolate, thin, of a dark-green on the upper surface, pale on the under, glabrous on both, but dotted with granules, ciliated with white, short, somewhat bristly, and sometimes bifurcate hairs, one-nerved, venoso-reticulate, ovate or elliptic, or elliptic-oblong, abruptly acuminulate, rounded at the base, two, to two and a half lines long, one, to a line and a half broad, petiole very short and narrow. (The leaves of the main stems and their branchlets are fallen off in the specimen under examination; the leaf-scars are verticillate, or nearly so; the whorls at about three lines distance from each other in the main stems, but very approximate on the branchlets). *Fructiferous ramules* (the *flowers* also are wanting on the specimen) disposed along the superior part of the branchlets, nearly filiform, erect, approximate, destitute of leaves and bracts, simple, bifurcate or paniculate. *Pedicels* short, erect, generally disposed in abbreviated three to five-flowered not uncommonly unilateral racemes, or sometimes subfastigiate. *Calyx* (fructiferous) appressedly pilose externally, extremely adherent, deeply five-parted, somewhat urceolate over its base; *Sepals* distinctly two-seriate, the two outer[2] very narrow,

[1] In these cases, the primina projects beyond the apex of the secundina in form of a short tube, whose upper extremity adheres to the placenta at the period of fecundation, so that the ovulum is really attached both by its funiculus and by the exostoma.

[2] The two exterior sepals of *Lechea* have been con-

flat, linear, suberect, somewhat longer than the inner, the three inner navicular with a slightly prominent dorsal keel, obtuse, mucronate, one-nerved, scarcely a line long, and one-fourth of a line broad, one of the edges rather membranaceous. *Capsule* a little longer than the interior sepals, and enveloped by them, somewhat exceeded by the outer sepals, thin, cartilaginous, smooth and shining, chestnut-brown, semipellucid, ellipsoid, obtuse, slightly trigonal, one-celled, by abortion three-seeded, three-valved from the summit till near the base, supported on a short stipitiform thecaphorum, from which it breaks off soon after the dehiscence; valves about a line long, connivent, navicular, placed opposite the interior sepals,[1] bearing along their central line the remnants of a membranaceous dissepiment, which before coming to maturity, was connected with the corresponding placenta; placentas three,[2] persistent, nearly central, almost as long and broad as the valves, crustaceous, very thin, fragile, elliptic-roundish, obtuse at both extremities, each of them enveloping a single solitary seed, by the side of which the abortive ovule is still observable. *Seeds* attached on the base of the posterior face of the placentas (in the angle originally formed by the corresponding dissepiment) by a short filiform ascendent funicle, orthotropous, arrect, minute, nearly as long as the placentas, ovate, trigonal (convex on their posterior, carinate on their anterior surface) smooth and shining, reddish-brown, and pellucid enough to allow the embryo to be seen through; tegument thin, crustaceous, micropyle punctiform, terminal; hilum and chalaza confluent in a brownish basilar areola; perisperm thin, corneous; embryo[3] rectilinear, or nearly so, axils antitropous, about as long as the perisperm; cotyledons somewhat narrower than the greatest breadth of the seed, thin, flat, elliptic; radicle pointing to the apex of the seed, of about the same length as the cotyledons, cylindrical, obtuse, straight, quite perpendicular to or a little oblique, in respect to the axis of the seed.

This species makes one of the collection of plants found by Mr. Drummond near Apallachicola, in Florida (*v. specimen unicum fructiferum in Herb. cl. Webb.*)

LECHEA THESIOIDES, *nob.*

L. thesioides, herbacea ramosissima tota pilosiuscula, foliis sparsis oppositisque anguste linearibus acutis ciliatis brevissime petiolatis, racemis elongatis foliatis laxifloris unilateralibus, pedicellis erectis calyce subbrevioribus, sepalis interioribus petala oblonga emarginata capsulam globosam obscure trigonam subtrilocularem paulo superantibus.

Plant four to eight inches high, herbaceous, apparently annual; the younger parts covered with a dense greyish silky pubescence, the older with very short white, more or less diverging hairs. *Root* perpendicular, short, slender, emitting some

sidered by several Botanists as bracts; but as they bear absolutely the same relation to the three interior sepals as in all other five-sepaled *Cistaceæ*, I see no reason why it is necessary to give them another name, unless it might seem more convenient to consider the calyx of the whole Order not as five-sepaled, but as three-sepaled, and in most cases accompanied at its base by two bracteoles. But then the inequality of number between the petals and sepals, which we are desirous of escaping by attributing a three-sepaled calyx to the few three-petaled species, would again present itself in regard to the five-petaled. It is, indeed, a curions peculiarity of *Cistaceæ*, and which confirms their close affinity with *Portulaceæ*, that even in the species provided with five petals and five sepals, the petals are not at all, as has been generally supposed, in alternate symmetry with the sepals, but are placed opposite to these, which disposition is, nevertheless, not always quite evident; so that it may be more proper, perhaps, to say that the petals are disposed unsymmetrically with regard to the sepals, as happens in those *Cistaceæ*, whose calyx is altogether destitute of the two exterior appendages.

[1] It is remarkable, that in *Lechea*, and some other genera allied to it, the valves of the capsule are not alternate with the interior sepals, as is the case in all other *Cistaceæ*, whose capsule is three-valved.

[2] These have been mistaken by Linnæus and his copyists for "internal valvulæ" of the capsule; M. Dunal has entirely overlooked them, in his so-called *Monograph of Cistaceæ*, which is a mere tissue of errors and the most superficial observations, he says, "*semina septo nervosæ affixa, paucissima, sæpius 8.*"

[3] I cannot understand what M. Dunal means by assigning to this genus an "*embryo dorsalis*," and again I am unable to agree with him when he describes the radicle as "*infera.*"

lateral filiform fibres. *Stem* single, erect, cylindrical, slender, branched from nearly its base to the summit. *Branches* alternate or opposed, axillary, cylindrical, more or less diverging, very slender and approximate, numerous, elongate, irregularly ramuliferous; their assemblage forming a tufted pyramidal or nearly fastigiate panicle. *Ramules* paniculate or simply bifurcate, filiform, the divisions all floriferous. *Leaves* scattered or opposite, destitute of stipules, entire, linear, acute at both extremities, thin, one-nerved, not veined, glabrous when adult, except on the margins, rather numerous on the branches of the stem, but less copious on the ramules; the cauline and greater rameal four to six lines long, one-fourth to one-half a line broad; the ramular nearly filiform, scarcely more than two lines long; the uppermost floral reduced to very minute bracteoles; petiole very short and narrow. *Flowers* about half a line long, disposed along the divisions of the ramules, in simple or bifurcate unilateral, erect, lax, rather bracteolated than foliose racemes, which reach finally the length of about an inch. *Pedicels* supra-axillary, rather capillary, straight; the floriferons strictly erect, the fructiferons somewhat diverging, and one-half to three fourths of a line long. *Calyx* persistent, accrescent, deeply five-parted, somewhat contracted at its base, greyish, with short appressed rough hairs; sepals distinctly two-seriate; the two exterior never imbricated, very narrow, flat, erect, linear, acute at both extremities; three interior imbricated (but never twisted) before and after flowering, somewhat shorter, but much broader than the exterior, navicular with a slightly prominent dorsal keel, elliptic, mucronate, one-nerved, one of the edges rather membranaceous; the fructiferons about a line long and half a line broad. *Receptacle* forming a short stipitiform thecaphorum. Disk inconspicuous. *Petals* three, inserted *at the base of the thecaphorum*, alternate with and by one-half shorter than the interior sepals, persistent, somewhat accrescent, narrow, exunguiculate, oblong, emarginate. *Stamens* three (rarely four), inserted *at the summit of the thecaphorum*, opposite the petals, and a little shorter than these, persistent; *filaments* capillary, free; *anthers* very minute, basifixed, innate, obreniform, dithecous, connectivum as narrow as the filament. *Pistil* shorter than the stamens. *Ovary* of the size of a poppy-seed, inadherent, incompletely three-locular; dissepiments projecting nearly to the centre of the cavity, fixed along the centre of its projecting face to the anterior edge of the corresponding dissepiment, and having its sides curved towards the periphery; ovules orthotropous, arrect, basifixed, oblong, collateral, attached by a short filiform ascendent funicle to the base of the posterior face of the placentas, one on each side of the dissepiment. *Style* deciduous, very short, filiform, erect, rectilinear. *Stigmas* three, multipartite, segments capillaceous. *Capsule* about the size of a cabbage-seed, enveloped by the three interior sepals, and somewhat shorter, cartilaginous, thin, pale-brown, smooth and shining, obscurely pellucid, globular, obtuse, slightly trigonal, incompletely three-celled, by abortion three-seeded, three-valved from the summit to the base, supported on a short stipes, from which it breaks off soon after the dehiscence; valves a little shorter than the interior sepals, and placed opposite these, connivent, persistent, navicular, bearing along their axis a cartilaginous dissepiment, which separates from the corresponding placenta some time before maturity; endocarp not separating from the mæsocarp; placentas three, nearly central, persistent, almost as long and broad as the valves, very thin, crustaceous, fragile, roundish, each of them enveloping a single seed, by the side of which the abortive ovule is still remaining. *Seeds* somewhat smaller than in *Lechea Drummondii*, but altogether of the same structure.

This species was found by Mr. Drummond, in the Province of Texas, (3rd collection, No. 18.)—(*v. s. sp. in Herb. Cl. Webb.*)

LECHIDIUM. (*nob.*)

Calyx persistens, accrescens, profunde 5-partitus, supra basin suburceolatus; sepala 2-seriata: 2 exteriora minima, plana,

linearia, æstivatione subdistantia; 3 interiora multo latiora, navicularia, dorso cristato-carinata, æstivatione et post anthesin imbricata, nunquam contorta. *Receptaculum* in thecaphorum breve stipitiforme productum. *Discus* inconspicuus. *Petala* 3, stipitis apice inserta, cum sepalis interioribus alternantia, persistentia, subaccrescentia, angusta, subunguiculata. *Stamina* 3, stipitis apice inserta! petalis anteposita, persistentia; filamenta libera, capillaria, antheræ minimæ, basi affixæ, innatæ, obreniformes; connectivo angustissimo. *Ovarium* minimum, liberum, subglobosum, incomplete 3-loculare, dissepimenta ex endocarpio orta, usque ad cavitatis axin fere producta; placentæ 3, biovulatæ, tenues, subrotundæ, ovarii diametro subæquilatæ, inter se liberæ, media linea dorsali dissepimenti oppositi margini anteriori adnatæ, utrinque recurvæ; funiculi breves, adscendentes, basi faciei posterioris placentarum utrinque ad angulum centralem, solitares; ovula orthotropa (primina, secundina, et nuclea haud ægre dignoscendis), arrecta, oblonga, basi affixa. *Stylus* deciduus, brevis, filiformis, rectus, erectus. *Stigmata* 3, capillaceo-multipartita. *Capsula* calyce tecta, cartilaginea, obscure pellucida breve stipulata, incomplete 3-locularis, ab apice ad basin septifrago-bivalvis, 6-sperma, valvæ sepalis interioribus dissepimentisque oppositæ, cymbæformes, conniventes, persistentes; endocarpio a mæsocarpio haud soluto; dissepimenta cartilaginea, bipartibilia, ante dehiscentiam margine suo posteriori valvarum axi adnata, margine quidem anteriori ab anteposita placenta nunquam soluto; *placentæ* 3, valvis subisometræ, dispermæ, subcentrales, persistentes, subcartilagineæ, suborbiculares, apice conniventes, lateribus subrecurvæ. *Semina* minuta, valvis subæquilonga, decidua, ovato-trigona (facie angulata, dorso convexa) lævigata, obscure pellucida, arrecta, orthotropa, ad basin faciei posterioris cujusvis placentæ collateralia, dissepimento interposito sejuncta, funiculo brevi adscendente persistente capillari affixa; integumentum tenue, crustaceum, micropylus terminalis, vix conspicuus, *hilum* cum *chalaza* in areolam parvam basilarem confluens; *perispermium* corneum; *embryo* axilis, antitropus, rectilineus, perispermio subæquilongus; *cotyledones* planiusculæ, subfoliaceæ, ellipticæ; semini fere æquilatæ; *radicula* recta, supera, cylindrica, obtusa, cotyledonibus subæquilonga.—Suffrutex (*Americanus*) *ramosissimus.* Folia *sparsa* (*raro subopposita, v. gemina*) *exstipulata, breve petiolata, integerrima.* Pedicelli *supra axillares, secus ramulorum apicem in racemos unilaterales dispositi; fructiferi subdeflexi v. divaricati.* Flores *minimi.*

This genus differs strikingly from *Lechea* by the dehiscence of its capsule, the dissepiments of which break off from the valves, but do not lose their adherence with their placentas, these, besides, are cartilaginous and dispermous, not thinly crustaceous and monospermous as in *Lechea;* the insertion of the petals at the base, instead of the apex of the thecaphorum, may be considered as an additional character. The following is the only species I am acquainted with.

LECHIDIUM DRUMMONDII. (*nob.*)

Root slender, ligneous, apparently creeping. *Stems* suffrutescent, solitary or subcæspitose, very slender, erect, about a span high, sparingly branched towards the summit, or branched from the base, covered with a thin chocolate-brown bark, the younger virgate, leafy, sparingly pubescent; the older destitute of leaves and glabrous. *Branches* very slender, alternate, somewhat divaricated; more or less paniculate, sparingly clothed with leaves, covered with short whitish appressed scabrous hairs. *Ramules* filiform. *Leaves* alternate (rarely subopposite or geminate) exstipulate, very entire, minute (those of the stems and branches three to seven lines long, one-sixth to one-third of a line broad; the uppermost of the floriferous ramules reduced to very minute filiform bracteoles), exactly linear, one-nerved, supported on a very short filiform petiole; the older glabrous or nearly so; the younger more or less clothed with short, bristly, decumbent,

whitish hairs. *Flowers* scarcely a line long, disposed along the extremities of the ramules, in simple, unilateral, erect, bracteolated, finally lax and somewhat elongated racemes. *Pedicels* supra-axillary, nearly capillary, two or three times longer than the calyx, generally much longer than the floral leaves, after flowering horizontal or deflexed. *Calyx* persistent, accrescent, deeply five-parted, externally pubescent like the young leaves; *sepals* distinctly biseriate; the two exterior very minute, flat, linear-filiform, acute, expanding, never imbricated; the three interior much broader than the exterior, usually somewhat shorter, cucullate (one of the sides rather membranaceous), obtuse, with a very apparent, cristate, denticulated dorsal keel; their margins before and after flowering imbricated and connivent, so as to form a three-winged sphæroid. *Receptacle* forming a short stipitiform thecaphorum. *Disk* inconspicuous. *Petals* three, inserted *at the summit of the thecaphorum*, alternate with the interior sepals, and somewhat shorter, marcescent, subaccrescent, oblong, or spathulato-oblong. *Stamens* three, inserted opposite the base of the petals, persistent, somewhat longer than the pistil, a little shorter than the petals; *filaments* capillary; *anthers* very minute, basifixed, innate, obreniform, connectivum as narrow as the filament. *Ovary* very minute, subglobose, inadherent, incompletely three-locular, placentas three, biovulate, each of them forming a thin elliptico-orbicular plate of nearly the same breadth as the diameter of the cavity, fixed along the axis of its posterior face to the anterior edge of the corresponding dissepiment, and having its sides slightly curved towards the periphery, except on the apex, which tends towards the centre, and is probably in connexion with the style; *ovules* orthotropous (provided with primina, secundina, and nucleus), arrect, basifixed, oblong, collateral, inserted (by means of a very short ascendent capillary funicle) at the base of the posterior face[1] of the placentas; one on each side of the dissepiment. *Style* deciduous, short, filiform, rectilinear, erect. *Stigmas* three, multipartite; *segments* capillaceous. *Capsule* about the size of a millet-seed, enveloped by the three interior sepals, thin, cartilaginous, smooth and shining, somewhat pellucid, chestnut-brown, globular, obtuse, slightly trigonal, incompletely three-locular, three-valved from the summit to the base, six-seeded, supported on a short stipes (the thecaphorum), from which it breaks off after the dehiscence, valves about a line long and three-fourths of a line broad, placed opposite the interior sepals, connivent, persistent, navicular, obtuse, breaking from the dissepiments; *dissepiments* cartilaginous, separable longitudinally in two plates, before maturity fixed by their posterior edge to the axis of the corresponding valve, the anterior edge never separating from its placentas, endocarp adhering, scarcely distinct; placentas three, nearly central, persistent, subcartilaginous, connivent at their summit, somewhat thickened on the margins, nearly the same length and breadth as the valves, of the same conformation as in the ovary. *Seeds* commonly two on each placenta, attached as in the ovary, arrect, orthotropous, almost filling up the space between the placentas and the pericarp, smooth and shining, ovate, trigonal (convex on the back, angular on their anterior surface), somewhat tapering at the summit, chestnut-brown, and pellucid enough (when viewed with strong light) to allow the embryo to appear through the tegument and perisperm; *tegument* thin, crustaceous, micropyle terminal, punctiform; *hilum* and *chalaza* confluent in a dark-brown basilar areola; perisperm thin, corneous; *embryo* rectilinear, axile, antitropous, a little shorter than the perisperm;

[1] This structure is peculiar to the present genus, and to *Lechea*; all the other *Cistaceæ* having their ovules attached on the anterior face, or on the margins of the placentas. Were the dissepiments of the above two-mentioned genera projected but a little more towards the centre of the cavity, so as to allow the placentas to cohere by their anterior surface, and adhere by their margins to the line of separation of the valves, then should we have a six-celled ovary, with a solitary ovule attached to the central angle of each cell.

cotyledons thin, flat, elliptic, obtuse at both ends; nearly as broad as the diameter of the perisperm; *radicle* pointing to the apex of the seed, slender, straight, cylindrical, obtuse, a little shorter than the cotyledons.

This species was found by Mr. Drummond in the Province of Texas (third collection, No. 19!, second collection, No. 17!)—(v. s. spec. in herb. cl. Webb.)

TÆNIOSTEMA.[1] (nob.)

Calyx persistens, accrescens, profunde 5-partitus, basi suburceolatus; sepala biseriata, 2 exteriora minima, plana linearia, æstivatione subdistantia; 3 interiora multo latiora, navicularia, ecarinata, æstivatione et post anthesin imbricata, nunquam contorta. *Receptaculum* in stipitem brevissimum productum. *Discus* inconspicuus. *Petala* nulla. *Stamina* 3 sepalis interioribus opposita (raro 4 v. 5), stipitis apice inserta, decidua; *filamenta* complanata lineari-spathulata: *antheræ* minimæ, filamentis continuæ, suborbiculares, thecis connectivo multo angustioribus. *Ovarium* minimum, subglobosum, trigonum, 1-loculare; *dissepimenta* 3 rudimentaria, vix conspicua, tenerrima, ex endocarpio orta, basi placentifera; *placentæ* 3 filiformes, brevissimæ, singulæ apice in funicula 2 ovulifera capillaria brevia, adscendentia, divergentia, divisæ; *ovula* orthotropa, arrecta. *Stylus* brevissimus, rectus, erectus, filiformis. *Stigma* in cristas 3 denticulatas partitum. *Capsula* parva, calyce obtecta, subtestacea, brevissime stipitata, ovato-trigona, 1-locularis, 3-valvis, abortu 3-sperma; *endocarpium* membranaceum, diaphanum, a mæsocarpio demum secedens; valvæ sepalis interioribus antepositæ, conniventes, persistentes, naviculares, medio rudimenta dissepimenti tenerrimi diaphani basi placentiferi gerentes; placentæ filiformes brevissimæ apice divisæ in funicula 2 capillaria, adscendentia, persistentia, altero ovulum abortiens gerente, altero seminifero. *Semina* ovato-trigona, lævigata, obscure pellucida, orthotropa! arrecta; integumentum crustaceum, tenue; *micropylus* apicilaris, punctiformis; *hilum* cum *chalaza* confluens in areolam basilarem. *Perispermium* corneum. *Embryo* subcircinnatus, subcentralis, antitropus! pro seminis indole magnus: *cotyledones* lineari-oblongæ, obtusæ, subcomplanatæ, apice deorsum spectantes; *radicula* supera, oblique adscendens, dorsalis, cylindrica, gracilis, obtusa, cotyledonibus fere æquilonga. Planta *herbacea pube stellata subtomentosa.* Folia *sparsa, exstipulata, integerrima, breve petiolata.* Pedunculi *axillares terminalesque brevissimi; pedicelli fasciculati.* Flores *minimi, sæpissime basi* 1-*bracteolati.*

This genus is distinguished from all the other *Cistaceæ* by the singular form of its stamens. Besides this character, it differs from *Lechea* (nob.) and *Lechidium* (nob.) by its basilar nearly rudimentary placentas, its circinnate embryo, and its apetalous flowers. I am acquainted only with the following species.

TÆNIOSTEMA MICRANTHUM. (nob.)

Lechea mexicana, Hort. Berol.

Plant herbaceous, clothed (particularly in its younger parts) with a greyish stellate tomentum. *Stems* four to six inches high, tufted, erect? tortuous, very slender, irregularly ramous, leafy. *Ramuli* filiform, more or less elongated, leafy, tortuous, commonly axillary, most of them floriferous. *Leaves* alternate, exstipulate, very entire, pubescent or tomentous on both their surfaces, oblong-spathulate, obtuse, mucronulate, nerved with pinnate veins, tapering to a short narrow petiole; the cauline about six lines long and nearly two lines broad; the ramular about twice or thrice as small. *Flowers* very minute, disposed in axillary and terminal clusters (or sometimes solitary or subsolitary in the inferior axils) throughout nearly the whole length of the ramuli. *Peduncles* very short, solitary, simple or bifurcate, erect, bearing from three to about twelve flowers, or less, frequently one or two-flowered. *Pedicels* fasciculate

[1] This name, alluding to the form of the stamens, is derived from ταινια, *ribbon*, and στημα, *stamen.*

or in irregular cymules, short, erect, commonly destitute of bracteoles, or sometimes provided with a minute subulate bracteole at their base. *Calyx* persistent, deeply five-parted, somewhat urceolate at the base, tomentose on its outer surface, at the period of flowering scarcely half a line long, then gradually acquiring the length of about a line; *sepals* distinctly two-seriate; the two outer very minute, flat, linear, never imbricated, the three inner much larger, navicular, but without an apparent keel, obtuse, one of their sides rather membranaceous, imbricated before and after flowering, but never twisted. *Receptacle* forming a very short stipitiform *thecaphorum*. *Disk* inconspicuous. *Petals* none. *Stamens* three, or less frequently four or five, inserted at the summit of the thecaphorum, opposite the interior sepals when equal in number, deciduous; *filaments* somewhat shorter than the calyx, linear-spathulate, complanate; *anthers* continuous with, and scarcely broader than, the filaments, roundish, obtuse, the polliniferous conceptacles much narrower than the connectivum. *Pistil* shorter than the stamens. *Ovary* inadherent, very minute, subglobular, trigonal, 1-locular with three incomplete very narrow pellicular dissepiments; *placentas* three, filiform, very short, each of them adnate to the base of the anterior edge of the corresponding dissepiment, and dividing themselves into two terminal, capillary, divergent, ascendent, short, ovuliferous funicles; *ovules* orthotropous! arrect. *Style* very short, rectilinear, erect, filiform. *Stigma* three-partite, each lobe forming a short denticulate crest. *Capsule* minute, inclosed in the interior sepals and somewhat shorter, subtestaceous, pale-brown, smooth and shining, obscurely pellucid and ovato-trigonal, obtuse, supported on a very short stipes, from which it breaks off soon after dehiscence, unilocular, three-valved from the summit to the base, by abortion three-seeded; *endocarp* finally separating from the *mæsocarp* under the form of a thin diaphanous pellicle; *valves* opposite the interior sepals, connivent, persistent, cymbiform, obtuse, about three-fourths of a line long, and scarcely half a line broad, bearing along their central line, an incomplete very narrow pellicular dissepiment, to whose base adheres the corresponding placenta; *placentas* three, filiform, very short, each of them ending in two capillary short, ascendent, persistent funicles; the one of these bearing a seed, the other the nondeveloped ovule. *Seeds* orthotropous, arrect, solitary on each placenta, minute (about half the length of the valves), smooth and shining, brownish, obscurely pellucid, ovato-trigonous, obtuse; *tegument* thin, crustaceous; *micropyle* punctiform, terminal; *hilum* and *chalaza* confluent in a basilar areola. *Perisperm* thin, corneous. *Embryo* antitropous, nearly circinnate, subcentral, voluminous in regard to the size of the seed; *cotyledons* linear-oblong, obtuse, flat; their summit curved towards the basis of the seed, and placed nearly in the centre of the circumvolution; *radicle* slender, cylindrical, obtuse, nearly as long as the cotyledons, dorsal obliquely ascendent.

This plant, as the name given to it in the Royal Botanic Garden of Berlin implies, is a native of Mexico, where it was probably found by Dr. Scheide. I have described it from dried specimens of the plants cultivated in the Jardin des Plantes at Paris.

HETEROMERIS. (*nob.*)

(*Helianthemi* species auctorum, characteribus omnino neglectis).

Flores heterogenei; alteri (plerique) minimi apetali, oligandri, oligospori, alteri (paucissimi, prius evoluti, longius pedicellati, in singulis inflorescentiis sæpissime solitarii) majores, 5-petali, polyandri, pleiospori. *Calyx* persistens, accrescens, profunde 5-partitus, supra basin suburceolatus, *sepala* 2-seriata: 2 exteriora parva angustissima, plana, æstivatione subdistantia; 3 interiora multo latiora, subnavicularia, ecarinata, æstivatione et post anthesin imbricata. *Receptaculum* in annulum parvum hypogynum productum. *Discus* inconspicuus. *Petala* sæpissime nulla, v. 5, receptaculo inserta, quoad sepala haud

symmetrica, decidua. *Stamina* receptaculo inserta, decidua, in floribus apetalis sæpissime 3 (sepalis interioribus anteposita) v. nonnunquam 4—12, in floribus petaliferis 20—30. *Filamenta* capillaria, libera. *Antheræ* adnatæ, basi affixæ, in floribus apetalis minimis obreniformes, v. subrotundæ apiceque emarginatæ, in floribus petaliferis ellipticæ; connectivum angustum, lineare. *Ovarium* liberum, minutum, subglobosum, 1-loculare; *placentæ* 3, immediate parietales, filiformes, in floribus apetalis 1—2 v. 4-ovulatæ, in petaliferis 4—12 ovulatæ; funiculi infra medium placentarum inserti (dum plures, per paria superposita) abbreviati aut plus minusve elongati, suberecti v. adscendentes, apice incurvi; *ovula* orthotropa! inversa; exostomate placentam spectante. *Stylus* brevis, filiformis, rectus, erectus. *Stigma* profunde divisum in cristas 3 (placentarum axi respondentes), fimbriolatas. *Capsula* sepalis interioribus obtecta, testacea, lævigata, obscure pellucida, trigona, 1-locularis, ab apice ad basin 3-valvis (rarissime 1-valvis) abortu 1-v. 3-sperma, aut raro (dum florum polyandrorum incrementum) polysperma; endocarpium tenerrimum, diaphanum, a mæsocarpio demum solutum; valvæ sepalis interioribus antepositæ, cymbiformes, persistentes, conniventes, ante maturitatem medio placentiferæ; *placentæ* 3, filiformes, persistentes, demum a valvis solutæ; nunc unica monosperma, ambeduæ vero alteræ abortu aspermæ, nunc omnes abortu monospermæ nunc raro omnes pleiospermæ; funiculi persistentes, capillares, abbreviati, aut sæpius plus minusve elongati, suberecti v. adscendentes, v. rarie arcuati. *Semina* in quavis placenta solitaria v. gemina, v. raro plura, inversa v. directione quoad pericarpium vaga, orthotropa, parva, lævigata v. subgranulosa, obscure pellucida, ovata, obtusa, facie plana, dorso convexa; integumentum tenue, crustaceum; *micropylus* terminalis, punctiformis; *hilum* cum *chalaza* confluens in areolam basilarem; *perispermium* corneum; *embryo* antitropus, circum perispermii partem centralem in trianguli fere modum flexus; *cotyledones* geniculatæ, adscendentes, planiusculæ, oblongo-lineares, obtusæ; *radicula* oblique adscendens, gracilis, cylindrica, obtusa, cotyledonibus paulo brevior.—Fruticuli (*Americani*) *foliis sparsis, exstipulatis, breve petiolatis, integerrimis.* Pubes *stellato-tomentosa.* Ramuli *floriferi axillares terminalesque v. subterminales, nudi v. subfoliosi, trichotomi v. subdichotomi; pedicelli cymosi v. subcorymbosi, v. fasciculati; nonnunquam brevissimi, sæpissime basi* 1-*bracteolati.* Florum *evolutio centrifuga.* Petala (*dum adsint*) *lutea.*

This genus is very remarkable, from the striking differences of size and conformation, exhibited by the flowers of each individual specimen. Besides the species hereafter described, the above character applies to *Helianthemum ramuliflorum*, Michx.! (*Heteromeris Michauxii*, nob.), and *H. corymbosum*, Michx. (*Heteromeris cymosa*, nob.). I am not acquainted with *Helianthemum rosmarinifolium* (Pursh and Elliott), but though the description of the plant given by these authors is exceedingly short, I am rather inclined to believe it may also prove a *Heteromeris*.

HETEROMERIS POLIFOLIA. (*nob.*)

H. polifolia, suffruticosa ramosa erecta pube stellata scabriuscula, foliis lanceolato-oblongis v. oblongo-linearibus v. sublinearibus obtusis inferne attenuatis supra canescentibus subtus calycibusque incanotomentosis, glomerulis axillaribus submultifloris subsessilibus, floribus apetalis 3-andris, placentis 1-ovulatis, floribus petaliferis sub 20-andris, placentis 4-ovulatis, capsulis globosis basi attenuatis, plerisque 1-spermis.

A *suffrutescent plant*, clothed nearly throughout with a more or less abundant stellate somewhat scabrous pubescence. *Root* slender, perpendicular, subligneous, scarcely branched. *Stem* six to twelve inches high, single, cylindrical, slender, erect, virgate, commonly branched in almost its whole length (less frequently without any other ramifications than short filiform axillary floriferous ramules), leafy, glabrous from the base to the distance of

some inches upwards, the upper part as well as the branches and ramules clothed with a scattered grayish pubescence. *Branches* nearly filiform, virgate, simple, almost erect, leafy for their whole length, subfastigiate, all of them bearing axillary very short floriferous ramules, along their upper part, and producing frequently fascicles of little leaves (abortive leafy ramules) in the axils of the inferior leaves. *Leaves* alternate, exstipulate, subcoriaceous, without other nerves but the midrib, which is rather prominent on the under surface, and forms a filiform groove on the upper, inconspicuously pennato-veined, scabrous, clothed with a thin scattered pubescence on the upper surface, and with a thick gray tomentum on the under, lanceolate-oblong, or oblong-linear, or sublinear (in the state of desiccation generally more or less revolute at their margins), obtuse, very entire, more or less tapering from the middle to the base; the cauline generally twelve to sixteen lines long, and about two lines wide in their greatest breadth; those of the branches four to nine lines long, and half to one and a half lines broad; those of the abortive ramules two to three times smaller; *petiole* very short and narrow. *Floriferous ramules* (peduncles) generally very short (so that the flowers, at first sight, seem crowded in the axils), erect, slender, generally solitary in the axils of the superior leaves both of the branches and the main stem; the inferior commonly three to seven-flowered, scarcely or nowise bifurcate, often having a leaf-like bractea at their summit; the superior (flowering before the others) many-flowered, bifurcate nearly from their base with a long solitary overtopping dichotomary pedicel; the terminal floriferous ramule sometimes about two lines long, and bifurcating at its summit. *Pedicels* ebracteolated, or more frequently with a minute subulate bracteole at their bases, fasciculated at the summit of the ramule, or disposed in a short compact corymb, along each of its bifurcations, erect, filiform, of very unequal length; the solitary dichotomary two to three lines long; the others extremely short at the time of flowering, but acquiring finally the size of a line or two. The *flowers*, already noticed in the Generic Character, offer two kinds, very different in structure; the long-stalked solitary dichotomary first-expanding flower of each partial inflorescence being alone petaliferous, polyandrous, and its ovary containing constantly a greater number of ovules; whilst all the other flowers of the same inflorescence are apetalous, most commonly triandrous, pauci-ovulated, and of much less size than the petaliferous. *Calyx* persistent, accrescent, deeply five-parted, somewhat urceolate over its base; sepals distinctly two-seriate, tomentose on their outer surface; the two outer minute, much narrower, flat, linear, sometimes adnate towards their base by one of their margins, never imbricated; the three interior much broader and a little longer than the exterior (those of the petaliferous flowers one line and a half long, and three-fourths of a line broad; those of the apetalous scarce half a line long at the time of flowering, but finally acquiring a length of three-fourths to one line), slightly navicular, but without a keel, ovate, subacuminate, delicately five-nerved, with a broad membranaceous margin on the one side, imbricated before and after flowering. *Petals* most commonly none or five, disposed in no symmetrical manner with regard to the sepals, deciduous, cuneato-obovate, yellow, longer than the calyx, inserted on the receptacle. *Receptacle* forming a little annular elevation around the base of the ovary. *Stamens* inserted on the receptacle, deciduous; three, or very rarely four in the apetalous flowers, about twenty in the petaliferous ones; *filaments* capillary, unconnected, shorter than the interior sepals; *anthers* basifixed, adnate, those of the polyandrous flowers elliptic, those of the oligandrous obreniform and very minute; *connectivum* linear, very narrow. *Ovary* minute, subglobular, trigonal, tapering at the base, unilocular, placentas three, immediately parietal, filiform, obliterated towards the summit of the ovary, each of them four-ovulated in the petali-

ferous flowers, invariably one-ovulated in the apetalons; *funicles* ascendent, capillary, inserted (in two superposed pairs, the placenta being four-ovulated) a little below the middle of the placenta, and reaching nearly to its summit; *ovules* orthotropous, inverted, presenting the exostoma to the placenta. *Style* overtopped by the stamens, filiform, rectilinear, erect, deciduous. *Stigma* deeply cloven in three fimbriolated crests. *Capsule* minute (generally about the size of a cabbage-seed, or double that size when originating from the dichotomary flowers), enveloped by the three interior sepals, and somewhat shorter, testaceous, brown, smooth and shining, subglobular, trigonous, obtuse, tapering at the base into a sort of stipes, one-celled, three-valved from the summit till near the base, one to three-seeded by abortion; endocarp pellicular, diaphanous, finally separating from the mæsocarp; *valves* connivent, persistent, cymbiform, before maturity placentiferous on their middle, placed opposite the three interior sepals; *placentas* three, persistent, nerviform, subulate at their summit, finally separating from the endocarp; generally but one of them seminiferous, whilst the two others bear but the remnants of the nondeveloped ovules, funicles ascendent or suberect, capillary, more or less elongated, persistent. *Seeds* inverted or of indeterminate direction with regard to the apex of the pericarp, orthotropous, ovate, obtuse, convex on their posterior, nearly flat on their anterior surface, almost as long as the cavity of the capsule, reddish-brown, smooth and shining, obscurely pellucid, tegument thin, crustaceous, micropyle punctiform, terminal; *hilum* and *chalaza* confluent in a basilar areola; *perisperm* corneous, *embryo* (visible by the aid of a strong light through the tegument and perisperm) antitroprous, curved nearly in the form of a triangle around the central part of the perisperm; *cotyledons* ascendent, geniculate, nearly flat, oblong-linear, obtuse; *radicle* obliquely ascendent, slender, cylindrical, obtuse, somewhat shorter than the cotyledons.

This species was found in the Province of Texas by Mr. Drummond (third collection, No. 20!), as also by M. Berlandier. Its compact axillary clusters of flowers will prevent any one from confounding it, either with *Heteromeris Michauxii*, nob., or *H. cymosa*, nob.: not to speak of various other important, but less obvious differences. I shall but add, that in the latter of these, the placentas of the apetalous flowers are always four-ovulated, and the placentas of the petaliferous ones about twelve-ovulated.

INFORMATION RESPECTING SEEDS WHICH HAVE BEEN FOUND IN ROMAN TOMBS, AND WHICH HAVE RETAINED THEIR POWERS OF GERMINATION.

By M. Charles Des Moulins, Correspondent of the Linnæan Society of Bourdeaux, &c.

(*From the Transactions of that Society.*)

In the spring of the year 1834, a proprietor of land in the Commune de la Mouzie-Saint Martin, in the Canton of Laforce, and Arrondissement of Bergerac (Dordogne), M. Geraud de Marcillae, having caused a piece of ground to be dug over to a considerable depth for the purpose of planting a vineyard, discovered a good many tombs, most of which presented this remarkable peculiarity, that the head of the skeleton deposited therein, rested on a heap of apparently well-preserved seeds.

M. de Marcillae, perceiving that the continuation of the work must necessarily destroy these highly valuable relics, had the enlightened consideration to delay the clearing of the ground, and to give notice of this discovery to M. L'Abbé Audierne, Vicar-General of Périgneux, to whom the Archæologia of this district is already indebted for much important assistance. M. L'Abbé, whose zeal would not permit him to remain inactive under such circumstances, promised a speedy visit to the sepulchres that had been already discovered, and earnestly recommended that the first tomb which the pick-axe should next de-

tect, might be left in the most entirely untouched state, until his arrival.

The graves at Mouzie offered three kinds of coffins :—

I. Stone coffins of a single piece, narrow towards the feet, and containing no seeds.

II. Brick coffins, containing seeds. These were about six feet long and twenty-one inches wide, but slightly narrowed towards the foot. Fourteen bricks, about twenty-two inches square, composed them. Each of the sides and the lid were formed of three bricks; two others were placed at the extremities, and the three which completing the number fourteen, forming the bottom of the grave, rested on cement. At the place for the head, which was supported by no particular pillow or bolster, was a round cup-shaped cavity, hollowed out in the cement, containing about two handsful of seeds, whereon, as upon a cushion, rested the occiput of the skeleton. The bricks, formed of very fine clay, superior to that now used in the country, are without any edge or mark of the mould, but still such as that no antiquary can refuse them the name of Roman Bricks.

III. Coffins, made of rubble (*moëllon*), larger than the former kind, and also containing seeds.

In the same field, were found a single brick, marked with the three letters LVP, about ten lines in height, also a monumental stone of white marble, bearing the monogram of Christ; a ring, a medal, some remains of lachrymatories, and a Roman weight. The graves contained no armour; no popular tradition whatsoever was attached to this cemetery, which had remained completely unknown till the period when the ground was dug up; but an aqueduct and some mosaics have been found near the field. These different circumstances, joined to the evidently Roman formation of the bricks, the beauty of their substance and their dimensions, which belong to a higher antiquity than the period when they were made of a coarser material and narrower size, the rectangular and slightly diminished form at foot of the sepulchral cavity, and finally the absence of an elevated bolster for the head, have led M. Andierne to refer the tombs in question to the third or fourth century of the Christian era, that is, the period when the Roman sway extended over our country.

On reaching the spot, M. Andierne proceeded to open the tomb of which, according to his directions, the investigation had been carefully reserved for himself. It was of the second kind, that is, made of brick. There M. Andrierne found seeds, in the very same situation as had been occupied by those in the coffins which the workmen had ransacked previously to his arrival. He carefully collected all those which lay in the sepulchre that he opened, both below and above the brick that supported the head of the deceased. They seemed to belong to a very few different kinds of plants, but having no one at hand who could determine them, he deemed it better to lay them aside till such an opportunity should arrive. Observing, however, two days after, that a considerable number of these seeds began to germinate in the paper that contained them, M. Andierne determined on sowing them immediately in two flower-pots and in a plot prepared on purpose, in the garden of M. Rousseau, nurseryman at Bergerac. He returned to this town on the 10th of August, and found that a great many of the seeds had grown up, some of the plants even being in flower and fruit. There were—

1. *Heliotropium Europæum*, one specimen of which, with a very strong and branching stem, exceeded sixteen inches in height, and was covered with flowers and seeds. M. Andierne dried some of the blossoming twigs, which he was so kind as to give me.

2. A great many plants of *Medicago lupulina*, which were, however, of small growth, two of these, which M. Andierne presented to me, were in flower, and one was in seed.

3. A single specimen of the wild *Blue Bottle (Centaurea Cyanus)*; I did not see it.

4. A single specimen, which did not

blossom, and which also I did not see, of a plant which the gardener could not determine.

On the 16th of August, M. L'Abbé Andierne took me to M. Rousseau's nursery-ground, whence I carried away the large plant of *Heliotropium Europæum*, from which those specimens in flower and seed had been gathered which M. Andierne had already transmitted to me. In the same plot I saw several young plants of *Medicago lupulina*, they were still without flower, bearing each only three or four leaves.

It is certainly to be greatly regretted that such an interesting experiment should not have been made with all the precautions necessary for avouching its irrefragable authenticity. Thus, it would have been highly desirable to ascertain what the seeds were, previously to sowing them; for it may be suspected, at first, that those which were put into the ground by M. Andierne never have sprung up, and that the plants which we gathered, instead of being the produce of parent-stems that had blossomed fifteen or sixteen hundred years ago, were simply the offspring of seeds recently deposited in the garden.

But I may reply to this, in the first place, that though *Heliotropium Europæum* and *Medicago lupulina* do spring up abundantly in carefully cultivated soil, it is not so with the *Blue Bottle*, which is generally found in the fields.

And secondly, that the larger proportion of the seeds found in the coffin were of a greenish tinge, and that the seeds of the *Heliotrope*, surrounded by their calyx as we gathered them, on the plant above mentioned, were recognised by M. Rousseau, as similar to those which had been sown.

Thirdly, That a portion of these seeds having been sown in pots to prevent any mistake, the plants in the pots and the garden-bed were identical, thus proving that both came from the one and the same seed.

Fourthly and lastly, that even supposing these proofs were defective, and that none of the plants were the produce of the seeds that M. Andierne had set, still the principal and most important fact, that of their *germination*, would not be in the least affected, but would remain indisputably authentic, because M. Andierne was only induced to deposit these seeds in the ground, because he had no hope of preserving them as they were, they having germinated precipitately, as soon as they came in contact with the air.

The above facts, therefore, establish the position, that certain kinds of seeds, if entirely excluded from the agents needful for vegetation, or rather, if shielded from the *combination of influences* requisite for germination, will maintain their vital property uninjured for the space of fifteen or sixteen centuries, and display it afresh when placed in favourable circumstances.

I say the *combination of those influences* which are necessary for germination; for warmth and moisture have doubtless existed in this case, sufficient to call into action the germinating principle in seeds, which could only be neutralized by the absence of the third requisite, namely, contact with the atmospheric air. From this reflection we must conclude that facts of this nature are far more common than is generally supposed, and that observation is all that we want on this point, as on many others. The theory of Silos is certainly based on this principle; but as the object there was an artificial preservation, attained by the prudent employment of numerous precautions, it seems to have been long imagined that analogous facts were rarely found in nature. Still, in 1824, M. Dureau de la Malle, in his valuable "Mêmoire sur l'Alternance" (published in the *Annales des Sciences Naturelles*, 1st series, vol. 5. p. 353 et seq.) has confuted this error by adducing numerous facts, all presenting the same combination of circumstances as what I am now describing, namely, the presence, to a requisite degree of warmth and moisture, and the absence of a sufficient quantity of air. From the observations of the above-mentioned *savant*, the following results have been obtained, that in the *Birch*, *Aspen*,

Furze, *Genista*, *Digitalis*, *Groundsel*, *Heath*, and *Whortleberry*, the germinative property is naturally preserved underground (and even beneath great heaps of grass??) for a century at least, and that under water, where the exclusion of air cannot be so perfect as under a thick bed of earth, the Birch and Mustard-seed retain this faculty for twenty or thirty years.

We know, too, that the seeds of plants of certain families, which were taken a few years ago out of the Tournefortian Herbarium, have sprouted; and in fact, when it is once established that the vital action may be suspended during so long a period, and yet not have its principle destroyed, we cannot refuse our belief to the possibility of this phenomenon being prolonged for a period equal to that during which the circumstances that delayed the usual time of germination may have lasted.

Here it must be well observed, that it is not an utter *absence of air*, such as would be effected by the air-pump, which is requisite for the preservation of seeds, for such a condition could only exist in the stony strata or the deepest layers of our earth. Without requiring to enter into calculation, we may safely affirm that warmth existed to a sufficient degree, in the tombs of La Mouzie, as well as in the situations described by M. De la Malle: and as to humidity, the experiments of M. T. de la Saussace on the *Desiccation of Seeds* (*Ann. des Sc. Nat.* 1827. 1st. Ser. vol. 10. p. 68, &c.) decidedly prove that in these graves, the dryness must have been far short of what would be needful to destroy the germinating property, at least as respects *Leguminosæ* and *Compositæ*, M. de la Saussace not having operated on any individual of the *Boragineæ*.

But once more, it is only in *particular families* that this suspension of the vital action may take place without its destruction ensuing in a determined time, because the chemical principles which exist in many kinds, operate in the interior of the seeds, independently of external agents. It were needful, then, that these chemical influences should be suspended, in order that the lethargy, so to speak, of the seeds, should be complete. Thus, oily seeds which are liable to become rancid, can only keep for a limited period.

However this may be, whether the limit assigned for the preservation of the germinating property in seeds be fixed at one century or two centuries; whether we grant or dispute the degree of antiquity which M. Andierne attributes to the tombs at Mouzie, it is still undeniable that the details above given establish the most remarkable instance known of this kind of longevity. I think, too, that the result of my reflections proves that it contains nothing that is incredible. It would appear easy, *à priori*, to establish the possibility of the fact, and I am happy in having had an opportunity of proving its reality.

An expectation was once entertained, though for a most brief period, of seeing the vegetating power exhibit itself in seeds of a much higher antiquity than those in the tombs of Mouzie. M. Kunth, in his inquiries respecting the plants found in the Egyptian tombs by M. Passalacqua (see *Annales des Sciences Naturelles* for 1826, 1st Series, vol. 8. p. 418, &c.) mentions some seeds of the *Palma Christi* or *Castor Oil Plant* (*Ricinus communis*) received from M. Joumard, which were in such a perfect state of preservation that he thought he could have brought them to germinate by means of chloride, but the attempt was unsuccessful. The seed of this Euphorbiaceous plant is, however, highly oleaginous. Among the twenty ancient plants which M. Kunth ascertained, there was not one belonging to the *Boragineæ*. The only *Leguminose one* was in flower (*Mimosa Farnesiana*, Linn.) Nine out of the twenty presented distinct seeds, and seven were in such perfect preservation, (among them the *Ricinus*) that M. Kunth could distinguish their organization, and even the embryo. I am ignorant of the situation of these seeds within the tombs; but if they were enclosed within the wrappers of the mummies, is it not probable that the emanations of the bitumen with

which these substances are impregnated, may have limited the duration of their vegetating property?

A circumstance has been lately stated, which, if authentic, would be still more surprising than the vitality of *ancient seeds*, since it relates to the very plant itself: I mean the common Onion, found in the hand of a mummy, and announced by Mr. Houlton to the Medico-Bótanical Society of London (see the *Echo du Monde Savant*, 1834, No. 17, p. 66) as having vegetated vigorously after a lethargy of two thousand years. The short quotation in the *Echo* is all the information I possess on this subject, and am not aware whether the needful precautions have been taken to guard against the deceptions practised by the modern Egyptians, who are said to be very skilful at frauds, where antiquities are concerned.

In summing up the whole of the circumstances, it may therefore be avouched, that the only authentic instance of such a prolonged vitality in seeds, is that which M. L'Abbé Andierne has stated to me. But we must be careful against deducing, from the certainty of the fact, any exaggerated consequences in this particular instance. The decidedly antique form of the tombs, their ancient materials, and the total absence of local tradition, may even be considered as probably warranting their reference to a more remote date by some centuries than what M. Andierne assigns to them. I may here, perhaps, be allowed to state some of the reasons which have led me to the belief that these graves contain the remains of Christians. From the *Recherches sur les Sepultures Nationales*, by M. Legrand D'Aussy, I borrow the dates and documents which serve as a starting-point for this discussion.

The custom of burning the body was preserved among the Gauls for more than two centuries after Julius Cæsar. It is at the cessation of this custom, which had been combined with that of the Tumulus, that this author places the commencement of his *3rd Epoch of Sepulture* (that of hillocks without combustion). As the type of this epoch, M. Legrand d'Aussy instances the Tumulus or Barrow of Crécy, near Abbeville, explored in 1787, and which contained two Sarcophagi (the form of which he does not state), each composed of several pieces of burnt clay (p. 76—7). Further on (p. 91 and 106), but without indicating the date to which they may be referred, he speaks of several instances of tombs, constructed wholly of bricks (one at Vic-le Comte, nine at Rheims, one at Auxerre, one at Barsac, near Bordeaux, discovered in 1725, and three at Strasbourg). That at Auxerre, seen and described by M. L'Abbe Lebeuf, was formed of twenty-six bricks, a foot and a half long, and almost equally broad. From these circumstances, in spite of the absence of the Tumulus, we may, I think, conclude that the tombs at Mouzie are of about the same date as that of Crécy (nearly the 3rd Epoch of M. Legrand D'Aussy), which corresponds to the close of the second, or commencement of the third century of the Christian era. At this period Christianity had long made its way into Gaul, the second persecution under Marcus Aurelius, in the year 177, having shed the blood of St. Pothin, the first Bishop of Lyons. This martyr is believed to have been sent to Gaul in 157, by St. Polycarp, himself a disciple of St. John the Evangelist, and we may therefore suppose that Christianity was introduced about the same time into the South-western provinces of our land.

The comparison of these dates with the epochs assigned by M. Legrand D'Aussy to the different modes of interment, seems to attest that the custom of burning the bodies, a custom that certainly appertained essentially to Paganism, diminished successively as Christianity made progress in Gaul, and finally ceased with the establishment of the true faith. In all religions the mode of its rites bears reference to theory, and wherever any religious belief exists, the funerals of the dead form a part of the worship. Thus Christianity, while it retained and sanctified the use of lustral water, proscribed the consuming of the body. Thus we are led to refer the tombs

at Mouzie to a period intermediate between the close of the reign of Marcus Aurelius (180) and that of Clovis (500), their antiquity only varying from thirteen to fifteen centuries.

One more reflexion let me be allowed to indulge, though it may depart a little from the immediate details of my subject. To what purpose, it is perhaps asked, have these seeds been enclosed in the coffins at Mouzie? I answer, that I here behold another inference, I might almost say a proof, in favour of the opinion which considers these sepulchres as the resting-place of Christians. In all ages, the Church has favoured those allegories which bore a pious meaning, and the symbols which were in unison with her sacred dogmas; how much more would this be the case, how far more complete would be the approbation that she would bestow on those which are based on those very dogmas? It is most evident that the depositing of seeds within a coffin is a sacred symbol, founded on Christianity. Can any rite bring more forcibly and tangibly to mind the fundamental doctrine of the resurrection of the body, the immortality of the soul? How frequently and how justly has the analogy been exhibited between the dying Christian and the poor creeping worm which rises brilliant and fresh from the temporary shroud in which it had lain apparently dead! And yet this is but a pious allegory of human invention, while the symbol of the seed is used by the Saviour of all men, the Lord Jesus Christ himself, when he says, speaking of his blessed self, "Except a grain of wheat fall into the ground and die, it abideth alone; but if it die, it bringeth forth much fruit." (St. John xiv. 24, 25.) See also 1 Cor. xv.

The seed will revive and rise again; life remains, which is essential to the production of fruit. The Church applies these divine words to all Christians. Bossuet (in his *Meditations on the Gospels*, Vol. I. p. 281) says, "We are the seed of wheat, and our life is hid within ourselves." I see therefore nothing improbable in the introduction, at different times, and especially in periods of persecution, and in various countries, of a pious custom which consisted in depositing within the tomb some symbol of the faith of the deceased and his family; for then the human race was happily far from that deplorable time when there was a vaunt of belonging to no creed. The object would be all the better accomplished by such seeds as were found by M. L'Andierne, (for I do not know the species to which those in the other graves may have belonged,) because they are the produce of insignificant and insipid plants, such as might come to hand in the first field, as hereby any other allegorical interpretation seems to be excluded. The Heliotrope, Blue Bottle, and little Lucerne must have been deposited there simply as seeds, nothing more. This is the first idea, the simple and fundamental part of the doctrine that would present itself to the mind before every other; and if (which is uncertain) the custom of putting plants and flowers into the coffins of Christians is also derived from the same source, it must be by more distant and indirect analogy. Thus, in the tomb of Childeric II, and his wife Bilihilde, at St. Germain des Près, each of the coffins was found to contain a wand of hazel, the intention of which does not seem evident, for it was not a representation of the sceptre, a sceptre being also laid into the coffin of the king. In that of the queen a bundle of aromatic herbs supported the head, and some branches of the same were scattered round and over the corpse; the explanation of which, whether natural or symbolical, is easy enough. Almost every where, the chaplet is an accompaniment of the interment of unmarried persons, the custom varying in its detail in various places—at Bourdeaux it is cast into the grave with the first spadeful of earth, elsewhere it is brought back to the church and kept near one of the altars, and at Perigord it is enclosed within the coffin, which is kept unscrewed to the last moment prior to dropping it into the grave.

I must remark, that before fixing definitively in my own mind the interpretation

which is given above, and which seems to me but natural, I have made all the researches in my power to ascertain the virtues attributed by the ancients to our wild Heliotrope, the Lucerne, and Blue Bottle, I could, however, detect nothing that was applicable to the depositing these seeds in the tomb; and if I regard them as used simply as *seeds*, I am unable to discover, among pagan writers, any circumstance which gives an allegorical or symbolical meaning to the custom.

CHARLES DES MOULINS.

Languais (Dordogne),
Dec. 9, 1834.

[I was the more interested in the above information respecting the vegetation of seeds which had been found in ancient sepulchres, from the circumstance, that at the time I received the volume of the Transactions containing it, I was favoured with a visit from the Rev. W. Burroughes of Hoveton Hall, Norfolk, who brought with him some living flowering plants of *Centranthus ruber* (*Valeriana rubra* of Linnæus), which he had raised from seeds taken by himself from an ancient coffin dug up at Wymondham Abbey in that county. In order to be perfectly sure that the produce was from these identical seeds, Mr. Burroughes did not allow his gardener to have the care of them, but sowed them in pots, which were kept separately, under melon-frames, and the same plants invariably sprung up, and no other. On his return into Norfolk he obligingly favoured me with the particulars contained in the following letter:—

My dear Sir,—I have sent you a small portion of the mixture from which the seed was taken that produced the specimens of *Centranthus ruber*, which I gave to you in the summer. In levelling the ground, formerly the site of Wymondham Abbey, the workmen came upon a flag-stone covering a brick grave, which contained two lead coffins, one large, the other very small. On opening them, the small one was observed to be perfectly air-tight. In it was found an envelope of linen cemented with resin. This was opened, and on removing a considerable quantity of seed, &c. another envelope was discovered, and amongst a quantity of coarse-grained muriate of soda, and fragments of odoriferous wood, was found a fœtus of about the fourth month. It was from this mass that the small quantity herewith sent was taken.[1] The larger coffin was not air-tight, owing to there having been a hole broken in the upper part. This coffin contained the body of a young female, wrapped in folds of cere-cloth, and preserved with great care and expense. The body was very perfect, except in that spot where the coffin was broken. From the state of preservation it was in, it was easily discovered to be the body of a young female, and from appearances, to be identified as the mother of the fœtus contained in the smaller coffin.

In regard to the probable date of the interment:—The abbey was founded in 1107, by William de Albini, who died in 1156. The spot where the coffins were found, was the middle of the choir, about eight feet from the East end, and consequently at the foot of the altar.

The choir being under the especial care of the religious of the Establishment, it is highly improbable that they should allow any female to be buried in it, unless nearly allied to, or immediately descended from, the founder. This, together with the state of interment, the evident antiquity, and the expense and care bestowed in the preservation of the body, leads to the conclusion, that the female was some near connexion of the founder, and buried about the middle of the twelfth century.

I am sorry that I cannot offer you any more information respecting the finding of this seed, as very soon after the discovery of the coffins the work was stopped, and nothing has been done to give a further clue to the date of interment.

I am, my dear Sir,
Yours very truly,
WM. BURROUGHES.]

Hoveton Hall, Oct. 11, 1836.

[1] This consisted chiefly of the seeds of some Umbelliferous plant.

BIOGRAPHICAL SKETCH OF JOHN FRASER, THE BOTANICAL COLLECTOR.

Born 1750—*died* 1811.

(With a Portrait.)

John Fraser, well known as a zealous and indefatigable collector of North American plants, was a native of Inverness-shire, whence, at about twenty years of age, he came to London in 1770. The individuals who were the first to patronize and encourage his devoted attachment to Botany, were the late Sir James Edward Smith, President of the Linnæan Society, Dr. Pitcairn, President of the College of Physicians, Mr. Aiton, the King's gardener at Kew, and Mr. Forsyth, Curator of the Apothecaries' Garden at Chelsea.

Between the years 1780 and 1784, Mr. Fraser visited Newfoundland in search of plants, and in 1785 commenced his researches in the southern States of North America, where he was employed for two years, and greatly advanced the interests of the cultivators of American plants, as well by his numerous discoveries, as by the various new genera and species which he introduced to this country. He also sent home different objects of Natural History and collections of seeds, while his skilful method of packing enabled him to transmit, uninjured, many living plants, to which the hazards of a long sea-voyage had always, previously, proved fatal. Those eminent nurserymen, Lee, Loddiges, and others, the patrons of American Horticulture, and the founders of the unrivalled establishments about London, acknowledged themselves deeply indebted to the services of Mr. Fraser.

Soon after his arrival in the State of South Carolina, the subject of this brief memoir formed a most intimate friendship with Walter, an American Botanist, who wrote the *Flora Caroliniana*, and when the premature death of this lamented friend took place, he engaged to publish his Flora in London.

On Fraser's second visit to America, in 1788, when on his route from Carolina to Georgia, he first met with that distinguished French Botanist and Traveller, André Michaux, who had then just started on an expedition to collect plants for the French Government; and with the son of this gentleman, the author of the celebrated *Monograph of the American Forest-Trees*, he also, at a later period, became acquainted.

Previously to this time, our traveller had repeatedly transmitted to London several valuable packages of plants, and he now returned, laden with a general collection of the result of his long and arduous labours, to which the most honourable testimony was borne in the botanical publications of that period.

Twice between the years 1789 and 96, did he revisit the North American Continent, extending his researches into the Interior, amongst the various Indian Settlements, traversing the range of the Alleghany Mountains, and exposing himself to such privations and hardships as nothing but the ardent zeal of the man, combined with the dauntless hardihood of the Highlander, could have enabled him to support. In 1796, he first visited Russia, taking with him a choice collection of American plants, which was purchased immediately on his arrival at St. Petersburgh, by the Empress Catherine, who, as a further proof of her approbation of his labours, and of the liberality with which Her Imperial Majesty patronised Science, was pleased to command him to set his own price on the collection. The decease of the Empress Catherine having taken place the next year, Mr. Fraser was honoured by an invitation, sent through Count Woronzoff, the Russian Ambassador at London, to proceed to Russia, carrying with him a selection of plants for the Imperial Garden of the Empress Maria, at Perlorskoe. The greatest success having attended this undertaking, he was most liberally rewarded and further received orders to furnish additional collections for the Imperial Gardens of Gatschina and Perlorskoe, and in the following year to bring from England all such new and approved implements for

[illegible]

Lithographed for the COMPANION to CURTIS'S Botanical Magazine,
from an Original Portrait in the poſseſsion of his Son Mr John Fraser.

horticultural and agricultural use as he might consider serviceable in Russia. Mr. Fraser showed so much zeal and ability in acquitting himself of this commission, that their Imperial Majesties, by an Ukase, signed Paul and Maria, dated Perlorskoe, August 1798, appointed him their Botanical Collector, with orders to furnish such other rare and novel plants, as he should recommend for the completion of the Imperial Collections. In consequence of these commands, Mr. Fraser, accompanied by his eldest son John, embarked in the year 1799, for the southern States of North America, where he prosecuted his researches in various unexplored parts of the Continent, both North and South, proceeding also far westerly. On the summit of the Great Roa or Bald Mountain, the main Apalichicola Ridge, which divides the eastern from the western waters, on a spot which commands a view of five states, namely, Kentucky, Virginia, Tenessee, North Carolina, and South Carolina, the eye ranging to a distance of seventy or eighty miles when the air is clear, North and N. West, South, S. E., and East, it was Mr. Fraser's good fortune to discover and collect living specimens of the new and splendid *Rhododendron Catawbiense*, from which so many beautiful hybrid varieties have since been obtained by skilful cultivators.

Upon completing this expedition in North America, he proceeded with his son in 1800 to the Island of Cuba, furnished with passports as American citizens, obtained with great difficulty, on account of the war then prevailing between Spain and Great Britain. But the voyage to Cuba proved most disastrous, and had well nigh put a term to all our enterprising traveller's further researches, for the vessel was wrecked on a Coral Reef, about eighty miles to windward of the Havannah, and forty miles from the main land. With sixteen of the crew, after six days of severe suffering, they were picked up by a Spanish wrecking boat, and conveyed to the Port of Matanzas, in the Island of Cuba. Through the kind aid of the American Consul, permission was obtained for Fraser and his son to proceed over-land to Havannah, where they had the singular good fortune to meet with those celebrated Botanists and intrepid travellers, Baron Humboldt and M. Bonpland, in whose enlightened society they passed some time, preparatory to their journey into the mountains, the Baron having introduced them to the Governor of Cuba, the Marquis de Somoruclos, who liberally granted them passports to travel and explore the island. The fact of these strangers being natives of Britain having been divulged in confidence by Humboldt to the Governor, that nobleman thus generously expressed himself, "My country, it is true, is at war with England, but not so with the pursuits of these travellers."

In the mountainous districts of Cuba, many new and interesting plants rewarded their researches, among which the most highly prized for its beauty was the *Jatropha panduræfolia*. Returning to America in 1802, Mr. Fraser embarked from thence for England, carrying his collections with him, but misfortune again attended his way, after being at sea some time, the ship sprang a leak, and passengers and crew were compelled to labour at the pumps night and day, and finally succeeded in reaching the Port of Nassau, New Providence, in the West Indies, which was the nearest land they could make. On arriving in England, after enduring all these sufferings and disappointments, a still heavier trial awaited Mr. Fraser in the intelligence which he received of the death of the Emperor Paul, his generous patron; and the fears which he entertained that his services might not meet with the recompence to which he deemed himself justly entitled were justified by the event, for on Mr. Fraser's repairing to St. Petersburgh, his claims were, after many months of disheartening delays, finally rejected by the Emperor Alexander, on the unworthy principle, that a reigning sovereign is not responsible for the engagements of his predecessor. From the Dowager Empress Maria, he received more gracious treat-

ment, the gift of a valuable diamond ring being added to the discharge of his account. The following summer he revisited St. Petersburgh, Mr. Fraser's claims to remuneration on account of his not being continued in the situation that His late Imperial Majesty had given him, being urged for reconsideration by the highest authorities; Lord Whitworth, Ex-Ambassador to the Russian Court, the President of the Linnæan Society, and several of the most eminent scientific characters attaching their signatures, and he was further aided by the official interference of the British Minister in Russia, Sir Borlase Warren.

Another summer and winter passed away in various solicitations for a decision on his claims, until the severity of the Russian climate, added to mental anxieties from suspense and disappointment, laid him for several months on the bed of sickness, when worn out beyond patient endurance, his necessities compelled him to accept a remuneration little proportioned to the services he had performed, and the heavy expenses he had incurred, independent of the loss of his valuable time.

In the hope of bettering his circumstances, the subject of this sketch undertook, in 1807, accompanied by his son John, another long and perilous journey, amongst the woods and wilds of North America. The American embargo having for some time interrupted the communication with England, young Fraser, immediately on its removal, proceeded home with the collections, leaving his father to return the following season, with the additional result of his labours: the intervening time was devoted by the latter to travelling among the mountains and in the western states, and he also made a second visit to the island of Cuba, and in the spring of 1810 arrived in England, enriched with various new productions. A short while, however, previously to his embarkation for Europe, when returning down from the mountains to Charleston, in South Carolina, his horse fell with him, and he unfortunately fractured several of his ribs, the distance from surgical aid aggravating his consequent sufferings. His vigorous constitution was greatly impaired when he reached London in the spring of 1810; and for several months he was wholly confined to his bed, until in the month of April 1811, his bodily disease being aggravated by the undeserved disappointments of his latter days, death deprived his two sons, John and James Thomas Fraser, of a parent, who was justly endeared to them by the ties of reciprocal affection, as well as by the perils and the pleasures in which, during long and remote journeys, for many years, they had mutually shared.

In disposition of mind, Mr. Fraser was remarkably frank and generous, caring so little about the pecuniary gains of his professional labours, that he frequently sacrificed all these considerations to his zeal for investigation, allowing the cultivators of his new discoveries to appropriate to themselves all the advantages that were his just due. The nurserymen and growers of American plants speak gratefully of him as their greatest benefactor, to whom they are indebted for such a variety of novel and beautiful plants as have richly repaid the skill exercised in their culture.

It unfortunately happened, that almost at the commencement of Mr. Fraser's career, he incurred the disapprobation of that Nestor of Science, the late Sir Joseph Banks, and as his spirit was too independent to allow of his doing any thing which resembled acting a courtier's part, so this slight misunderstanding might never have been removed, if (to the honour of Sir Joseph Banks be it spoken) the superior individual had not unexpectedly visited Mr. Fraser shortly before his decease and during the short interview which he requested, extended to him the hand of friendship, addressing the sufferer in such kindly terms as proved a temporary cordial, and were most gratefully acknowledged by the dying man.

Mr. Fraser, during his first visit to the island of Cuba, had noticed a remarkable species of the Palm Tribe, the leaves of which, by a peculiar process, were prepared

and used for making light elastic and durable summer hats and bonnets. Having obtained a patent for this manufacture, it was brought out under the gracious patronage of her late Majesty, Queen Charlotte. The work was superintended by his sister, and he was extremely sanguine as to its importance to his family, but disappointment attended the speculation, and his persevering exertions were frustrated by the want of capital.

A list is here subjoined of North American plants, discovered and introduced by John Fraser, from the year 1785, taken from his own *Hortus Siccus*, in possession of his son, J. Fraser, F.L.S. and H.S., who was his father's companion in all his journeys to Russia, and in the two last of his expeditions to North America and the West Indies. After the decease of Mr. Fraser, senior, this son proceeded to North America, with a view to form a collection of plants, and in 1817 returned to England, bringing several choice new species, and a large selection of the more desirable kinds, gathered chiefly in the southern states, having extended his researches further South than his father, in East Florida. These collections he disposed of on his return, by public sale, after which he formed a respectable nursery or botanical establishment in Kent, called *the Hermitage*, near Ramsgate, and having last year (1835) retired from business, he was succeeded by Mr. Wm. Curtis, son of Mr. S. Curtis, of Glazenwood, Essex, the proprietor and publisher of the Botanical Magazine, as well as of the original work in which this brief memoir now appears.

To Mr. J. Fraser, jun., our gardens are indebted for the introduction of that splendid and highly varied genus, the *Dahlia*. The *D. coccinea*, a single-flowered scarlet species, was the first seen in this country, and endless are the hybrid varieties and beautiful double flowers obtained from this humble origin, by the great skill of our present Horticulturists, those "*Makers of Flowers*." The description, accompanied by a representation of the original species, will be found on referring to Curtis's Botanical Magazine, tab. 210, published in 1803; and the second known kind of *Dahlia* was introduced to our gardens, from Madrid, by Lady Holland, about three years subsequently.

NORTH AMERICAN PLANTS, DISCOVERED AND INTRODUCED BY JOHN FRASER, BETWEEN 1785 AND 1799; AND BY J. FRASER, JUN., FROM 1799 TO 1817.

Agrostis Cornucopiæ.
Andromeda cassinæfolia, Bot. Mag. t. 970.
——— Catesbæi, Bot. Mag. t. 1955.
——— dealbata, Bot. Reg. t. 1010.
——— ferruginea.
——— floribunda, Bot. Mag. t. 1566.
——— serratifolia.
Annona pygmæa.
Aletris aurea.
Allium cernuum, Bot. Mag. t. 1324.
——— reticulatum.
Asarum arifolium, Hook. Ex. Fl. t. 40.
Asclepias amplexicaulis.
——— acuminata.
——— Linaria.
——— pedicellata.
——— perfoliata.
——— salviæfolia.
Azalea arborescens.
——— calendulacea, Bot. Mag. t. 1721 (β.)
——— canescens.
——— coccinea, Bot. Mag. t. 180.
——— glauca.
——— nitida.
Bartsia coccinea.
Befaria racemosa.
Betula lutea.
Blandfordia cordata.
Buchnera pedunculata.
Calycanthus glaucus, Bot Reg. t. 404.
——— lævigatus, Bot. Reg. t. 481.
Carex Fraseriana, Bot. Mag. t. 1391.
Chaptalia tomentosa, Bot. Mag. (Tussilago integrifolia) t. 2257.
Clethra scabra.
Collinsonia ovalis.
——— tuberosa.
Commelina angustifolia.
Convolvulus tenellus.
Coreopsis latifolia.
Corypha Hystrix.

Cristaria coccinea, Bot. Mag. t. 1673.
Croton maritimum.
Cypripedium pubescens, Lodd. t. 895.
Cyrilla Caroliniana, Bot. Mag. t. 2456.
Diospyros pubescens.
Dracocephalum cæruleum.
Echites difformis.
Elæagnus argenteus.
Erigeron bellidifolium.
——— compositum.
——— nudicaule.
Euphorbia Ipecacuanha, Bot. Mag. t. 1494.
——— marginata.
Frasera Walteri.
Galardia bicolor, Bot. Mag. t. 1602, and vars. 2940, and 3368.
Gentiana crinita, Bot. Mag. t. 1039 (G. fimbriata).
——— incarnata, Bot. Mag. t. 1856.
Gerardia flava.
——— quercifolia.
——— tenuifolia.
Gnaphalium undulatum.
Hamamelis macrophylla.
Helonias angustifolia, Bot. Mag. t. 1540.
Halesia parviflora.
Hydrangea quercifolia, Bot. Mag. t. 975.
——— radiata.
Hypoxis juncea.
Ilex angustifolia.
Ipomæa Jalapa, Bot. Mag. t. 1572.
——— Michauxii.
——— sagittifolia.
Illicium parviflorum.
Ipomopsis elegans, Bot. Reg. t. 1281.
Jeffersonia diphylla, Bot. Mag. t. 1513.
Juglans amara.
——— porcina.
——— sulcata.
Kalmia hirsuta, Bot. Mag. t. 138.
——— rosmarinifolia.
Larix Fraseri.
Laurus Caroliniensis.
——— Catesbæi.
——— Diospyros, Bot. Mag. t. 1470.
——— melissæfolia, Bot. Mag. t. 1470.
Liatris cylindracea.
——— elegans.
——— odoratissima.
——— pilosa.
——— sphæroidea.
Lilium Catesbei, Bot. Mag. t. 259.
Lobelia puberula, Bot. Mag. t. 3292.
Lonicera Caroliniensis.
——— flava, Bot. Mag. t. 1318.
Lupinus villosus.
Macbridea pulchra.
Magnolia auriculata, Bot. Mag. t. 1206.
——— Fraseri.
——— cordata, Bot. Reg. t. 325.
——— macrophylla, Bot. Mag. t. 2189.
——— pyramidata, Bot. Reg. t. 407.
Malachodendron ovatum, Bot. Reg. t. 1104.
Malaxis unifolia.
Menziesia ferruginea, Bot. Mag. t. 1571.
——— globularis.
Mespilus spathulata.
Muhlenbergia diffusa.
Nelumbium macrophyllum.
Neottia cernua, Bot. Mag. t. 1568.
——— tortilis.
Nymphæa odorata, Bot. Mag. t. 819.
——— reniformis.
Œnothera cæspitosa, Bot. Mag. t. 1593.
——— Fraseri, Bot. Mag. t. 1674.
——— glauca, Bot. Mag. t. 1606.
——— macrocarpa, Bot. Mag. t. 1592.
——— Missourensis.
Orchis spectabilis, Exot. Fl. t. 69.
Pachysandra procumbens, Bot. Mag. t. 1964.
Pavia macrostachya.
Pancratium Carolinianum, Bot. Reg. t. 926.
Pedicularis Canadensis, Bot. Mag. t. 2506.
Pinguicula lutea, Bot. Reg. t. 126.
Phalangium esculentum, Bot. Mag. t. 1574. (Quamash).
Pinckneya pubescens.
Pinus lutea.
——— palustris.
——— pungens.
Phlox acuminata, Bot. Mag. t. 1880.
——— amæna, Bot. Mag. t. 1308.
——— Carolina, Bot. Mag. t. 1344.
——— nivea.
——— pyramidalis.
——— setacea, Bot. Mag. t. 415.
——— stolonifera, Bot. Mag. t. 563.
——— subulata, Bot. Mag. 411.
Pontederia lanceolata.
Polygonum arifolium.
Prunus Chicasa.
——— maritima.

Prunus pygmæa.
Pycnanthemum lanceolatum.
——— verticillatum.
Pyrola maculata, Bot. Mag. t. 897.
—— repens.
Pyxidanthera barbulata.
Quercus Bannisteri.
——— Catesbæi.
——— castanea.
——— hemisphærica.
——— imbricaria.
——— laurifolia.
——— lyrata.
——— Michauxii.
——— montana.
——— olivæformis.
——— prinoides.
——— tinctoria.
Rhexia Caroliniensis.
Rhododendron Catawbiense, Bot. Mag. t. 1671.
——— punctatum, Bot. Reg. t. 37.
Ribes aureum, Bot. Reg. t. 125.
—— hirtellum.
—— resinosum, Bot. Mag. t. 1583.
Rosa Caroliniensis.
—— lævigata.
Rudbeckia pinnata, Bot. Mag. t. 2310.
Sagittaria falcata.
——— graminea.
——— latifolia.
Salix cordifolia.
—— falcata.
Salvia azurea, Bot. Mag. t. 1728.
Sarracenia adunca, Bot. Mag. t. 1710.
——— rubra, Bot. Mag. t. 3515.
Satyrium repens.
Schizandra coccinea, Bot. Mag. t. 1413.
Scutellaria Canadensis.
Sideranthus pinnatifidus.
——— villosus.
Silene Pennsylvanica, Bot. Mag. t. 3342.
—— Virginica.
Smilax lanceolata.
—— pubera.
—— quadrangularis.
Streptopus roseus.
Thalia dealbata, Bot. Mag. t. 1690.
Thymbra Caroliniana, Bot. Mag. t. 997.
Tradescantia rosea.
Trillium pictum.
——— pusillum.
Vaccinium buxifolium, Bot. Mag. t. 928.
——— frondosum.
——— myrsinites, Bot. Mag. t. 1550.
——— myrtifolium.
——— nitidum, Bot. Mag. t. 1550.
——— parviflorum, Bot. Mag. t. 1288.
Verbena bracteosa, Bot. Mag. t. 2910.
——— rugosa.
Viola papilionacea.
—— pedata, Bot. Mag. t. 89.
—— pubescens.
—— rotundifolia.
Virgilia lutea.
Ulmus alata.
Uniola paniculata.
Uvularia grandiflora, Bot. Mag. t. 1112.
Waltheria Caroliniana.
Xyris Canadensis.
Yucca Missourensis.
—— recurva.
—— serrulata.
Zamia pumila.

ILLUSTRATIONS OF INDIAN BOTANY.

By Dr. Wight & G. A. W. Arnott, Esq.

(Continued from page 250.)

ACALYPHA ALNIFOLIA.

TAB. XXIX.

Dioica, fruticosa, foliis cordato-ovatis obtusiusculis crenatis ramisque pilosis, spicis masculis filiformibus fœmineis interruptis, involucris dentatis pilosis.

Acalypha alnifolia. *Willd. Sp. Plant. v.* 4. *p.* 525. *Spreng. Syst. Veg. v.* 3. *p.* 883.

A low, very ramous *Shrub. Branches* slender, cylindrical, thickly covered with long, white, patent hairs. *Leaves* alternate, long-petioled, subcordato-ovate, obtuse, crenate, furnished on both sides with a few long, white hairs, most numerous towards the margin. *Petioles* slender, usually about the length of the limb, hairy. *Flowers* monœcious, spiked. *Male* spikes below, axillary, solitary, longer than the leaves, for about two-thirds of their length

covered with numerous clusters of small green flowers, mixed with hairs and minute bracteæ. *Female* spikes terminal, or in the bifurcations of the branches, nearly sessile, short or capitate, few-flowered.

Male flowers minute. *Calyx* four-cleft, beset with glands towards the apex. *Corolla* none. *Stamens* four? *filaments* short; *anthers* two-celled; *cells* distinct, very long and vermiform. *Female sepals* three, ovate, acute, distant from each other: *ovary* three-celled: *styles* three, very long, red, finely laciniated. *Capsule* three-celled, three-valved: *cells* one-seeded. *Seeds* ovate.

Found in mountain districts of Madras, among grass, &c.

Fig. 1. Portion of a male Spike. 2. Bractea and female Flower. 3. Transverse section of the Germen:—*magnified.*

EXCŒCARIA AGALLOCHA.

TAB. XXX.

Dioica, floribus masculis fœmineisque amentaceis, fructibus racemosis, foliis ovatis coriaceis nitidis crenato-serratis.

Excœcaria Agallocha. *Linn. Sp. Pl. p.* 1451. *Willd. Sp. Pl. v.* 4. *p.* 864. *Spreng. Syst. Veget. v.* 3. *p.* 25.

Arbor excœcaria. *Rumph. Amb.* 2. *p.* 237. *t.* 79, 80.

A small *Tree,* or large ramous *Shrub,* with brown rather rough *bark* on the trunk and larger branches. *Petioles* alternate, smooth, furrowed above, about an inch in length. *Leaves* coriaceous, ovate, obtusely crenato-serrate, terminating in a short, rather obtuse acumen; from three to four inches long, and from one and a half to two inches broad; smooth, shining, green above, pale glaucous beneath. *Flowers* dioicous on axillary catkins. *Male catkins* either solitary or in pairs, often longer than the leaves. *Female* ones two or three together, usually shorter than the petioles, lengthening, however, as they advance to maturity, and finally becoming, when in fruit, loose *racemes.*

The *male* flowers consist, first, of a large, broad anterior, and two small posterior, subulate, toothed *scales,* furnished at the base with glands; these being inferior, and occupying the place of the calyx, I shall call them *calycine scales* (*a.*); secondly, of a thick fleshy *receptacle* (*b.*), bearing the stamens, and three other subulate scales, which, as occupying the place of the corolla, I propose calling *corolline scales.* (*c.*)

Stamens; filaments three, filiform, long in proportion to the other parts of the flower: *anthers* large, two-celled, cells globular.

Female flowers. The coverings of these are the same as in the male flowers, but differing in the form of the corolline scales, which are here broadly ovate, embracing the germen. The glands at the base of the posterior calycine scales are here fewer in number, and larger than in the male flowers. *Pistil: germen* superior, three-celled: *style* none, or very short: *stigmas* three, diverging, tapering to a point, covered on their upper surface, from the base to the tip, with a viscid secretion. *Capsule* three-celled, marked with a deep furrow between each. *Cells* containing one seed, and opening in the middle between the furrows. *Seeds* globular, smooth, brownish-coloured. *Cotyledons* orbicular, foliaceous.

This plant is usually found in salt marshy ground, on the banks of rivers near the sea, growing equally well in fresh or salt water. Owing to this property it is employed for strengthening the banks of rivers near the sea, which contain fresh or salt water, according to the season of the year. This is the case with most of the mouths of the Cavery River, which, during the dry season, are filled with salt, during the rainy, with fresh water. The *Avicennia tomentosa* is used for similar purposes.

A. Male Branch. B. Female ditto:—*nat. size.* 1. 1. Male Flowers. 2. 2. Female Flowers. 3. Raceme of Fruit. 4. Seed:—*nat. size.* 5. Seed laid open to show the Embryo:—all but fig. 4 *magnified.*

NEW CEYLONESE MELASTOMACEÆ.

By G. A. W. Arnott, Esq.

The following species have been collected by Col. Walker, in Ceylon, and most of them transmitted to Professors Hooker and Graham, in whose Herbaria I originally examined them. Some have been since found in the same island by Dr. Wight, while residing there for six weeks, in order to recover his health after a severe attack of jungle fever. I refrain from describing at present the new peninsular species which I have received since the publication of the first volume of the Prodromus Fl. Penins. Ind. Or.

I. SONERILA.

1. S. *Ceylanica* (Wight et Arn.); herbacea erectiuscula, caule (3—10-pollicari) ramoso, ramis acute tetragonis glabris, foliis petiolatis e late ovatis in ovato-oblonga argute serrulatis basi 3—5-nervibus supra parce strigosis subtus glabris, petalis late ovalibus acutis, antheris cordato-ovatis obtusiusculis stylum æquantibus, stigmate capitato, capsula turbinata 6-costata.—S. Seylanica, *W. et A. Prod. Fl. Pen. Ind Or. p.* 322 (in adnot.). In montibus Ceylani ad alt. 6000 ped.

When we gave this the specific name, it was the only species with which we were acquainted, from Ceylon: now that several are known, and indeed they are more numerous there than in any district of India of the same size—it might perhaps be right to change it. This and all the following species are conspicuously caulescent and branched.

2. S. *affinis* (Arn.); herbacea, caule adscendente basi radiculoso ($\frac{1}{4}$—2-pedali), ramoso glabro, ramis tetragonis calyceque glabris vel parce pilosis, foliis e late ovatis obtusis in oblonga acuminata argute serrulatis supra parce strigosis subtus glabris, racemis brevibus sessilibus vel basi foliis binis parvis instructis, pedicellis secundis approximatis gracilibus, petalis ovalibus acutis, antheris cordato-oblongis apice attenuatis stylum filiformem subæquantibus, stigmate capitato, capsula longiuscule turbinata 6-costata.—In Ceylano ad alt. 6000 ped.

Affinis habitu *S. Brunonis* et *S. Ceylanicæ*, at antheris attenuatis differt: folia tam in hac quam in S. *Ceylanica* sunt in iisdem exemplis basi vel subæqualia vel valde inæqualia.

3. S. *glaberrima* (Arn.); herbacea erecta, caule (6—8-pollicari) parce ramoso, ramis acute tetragonis glaberrimis, foliis ovatis vel oblongis acutiusculis basi subtrinerviis utrinque glaberrimis inconspicue et parce serratis, serraturis adpressis, racemis breviter pedunculatis, pedicellis secundis et calyce ad basin parce pilosis, petalis ovalibus acutis, antheris lanceolatis acuminatis stylum medio dilatatum subæquantibus, stigmate punctiformi, capsula breve turbinata.—In montibus Ceylanensibus.

Of this I have seen only one specimen, in Dr. Graham's Herbarium. It and the two preceding have the stem and branches either glabrous, or nearly so; in the following they are hirsute.

4. S. *hirsutula* (Arn.); herbacea diffusa, caulibus elongatis (bipedalibus vel ultra) vage ramosis, ramis hirsutis, foliis longiuscule petiolatis cordato-ovatis obtusiusculis argute serratis basi 3—5-nerviis supra strigoso-hirsutis subtus pallidis ad nervos venasque hirsutis cæteroquin glabris, racemis terminalibus subumbelliformibus sessilibus 3—5-floris, pedicellis calycem parce pilosum æquantibus, petalis ovatis acuminatis, antheris lanceolato-subulatis stylum superantibus, stigmate subcapitato, capsula cupulato-turbinata sexcostata, costis æqualibus valde prominulis.—In montibus Ceylani ad alt. 6000 ped.

Flores majusculi.

5. S. *Wightiana* (Arn.); herbacea erecta, caulibus ($\frac{1}{2}$—1-pedalibus) ramosis ramisque hirsutis, foliis petiolatis ovatis argute serrulatis ciliatis basi 3—5-nerviis supra hirsutis, subtus pallidis ad nervos venasque setoso-hirsutis, racemis terminalibus breve pedunculatis umbelliformibus paucifloris, pedicellis calycem hirsutum æquantibus, petalis ovalibus acutis, antheris lineari-lanceolatis obtusiusculis stylo

brevioribus, stigmate punctiformi. — In montibus Ceylanensibus.

A *S. hirsutula* differt petalorum et antherarum forma, at habitu convenit: inter *S. hirsutulam* itaque et *S. Hookerianam* medium iter tenet.

6. S. *Hookeriana* (Arn.); erectiuscula, caule lignescente ramoso (1½—2-pedali), ramis dense rufo-villosis, foliis longiuscule petiolatis ovatis oblongisve ciliato-serratis utrinque parce at subtus ad nervos copiose rufo-pilosis, petiolis hirsutis, racemis paucifloris pedunculatis basi 1—2-foliatis, pedicellis secundis calyceque parce pilosis, dentibus calycinis triangularibus acutis, petalis late ovalibus acutis, antheris cordato-ovatis obtusiusculis, stylo filiformi, stigmate capitato, capsula breviter turbinata costis omnibus subæqualibus obtusis.—In insula Ceylano ad basin coni montis "Adam's Peak."

7. S. *robusta* (Arn.); erectiuscula, radice squamata, caule lignescente valido ramoso, ramis densissime patentim pilosis, foliis approximatis brevissime petiolatis subcordato-ovalibus obtusis 5-nerviis ciliato-serratis utrinque strigoso-hirsutis, racemis hirsutis paucifloris subsessilibus basi 1—2-foliolatis, pedicellis secundis calycem subæquantibus, calycis pilis patentibus apice glandulosis hirsuti dentibus triangularibus obtusis, petalis late ovalibus acutis, antheris lanceolato-subulatis, stylo filiformi, stigmate punctiformi, capsula oblongo-turbinata costis lateralibus cæteris multo minoribus prominulis.—In insula Ceylano ad basin coni montis "Adam's Peak."

As the above descriptive characters may be thought by some to be too detailed, I shall here add shorter ones, which may distinguish the hitherto discovered Ceylon species from each other, although probably insufficient to separate them from some found in other parts of India.

1. S. *Ceylanica;* branches glabrous, anthers cordate-ovate, obtuse.

2. S. *affinis;* branches nearly glabrous, anthers cordate-oblong attenuated, style filiform, stigma capitate.

3. S. *glaberrima;* branches and leaves glabrous, anthers lanceolate acuminated, style thickened in the middle, stigma minute.

4. S. *hirsutula;* stem herbaceous, branches hirsute, petals ovate acuminated, anthers lanceolate-subulate.

5. S. *Wightiana;* stem herbaceous, branches hirsute, anthers linear-lanceolate, obtuse, stigma minute.

6. S. *Hookeriana;* stem somewhat woody, branches clothed with reddish short wool, anthers cordate-ovate obtuse, stigma capitate.

7. S. *robusta;* stem somewhat woody, branches covered with close spreading hairs, petals broadly oval acute, anthers lanceolate-subulate.

II. OSBECKIA.

1. O. *truncata* (Don); caulibus herbaceis vel basi sublignosis parce ramosis hirsutis, foliis patentibus vel deflexis ovatis vel oblongis integerrimis supra et subtus præsertim ad nervos strigoso-hirsutis ciliatis trinerviis duobus vel sæpe quatuor supremis approximatis flores subumbellatos breve pedicellatos involucrantibus, calyce urceolato pilis simplicibus palmatisque tecto, laciniis 4 primo intus coloratis tandem deciduis, appendicibus deciduis lacinias calycinas subæquantibus setis coronatis, antheris 8 erostratis obtusis, ovario setis numerosis coronato.—*W. et A. Prodr. Fl. Penins. Ind. Or.* 1. *p.* 332. *Wight, Cat. n.* 1144.—O. cupularis. *Wight, Cat. n.* 1148. *b.* (non *a.*)—In Peninsulæ Indiæ Orientalis montibus australioribus, atque in insula Ceylano, ad alt. 6000 ped.

The above character is taken from more perfect specimens than were before us when the species was first described: it is probable that most of the specimens of Wight's Cat. n. 1148, which were distributed, belong to this species, and not to *O. cupularis:* the number of calycine segments and stamina will distinguish the two: young specimens have much the same habit, which had led to their having been mixed in the distribution.

2. O. *parvifolia* (Arn.); suffruticosa procumbens radicans parvula ramosa, ramis glabriusculis vel parce strigosis tetra-

gonis, foliis ovatis brevissime petiolatis trinerviis utrinque parce strigosis subtus sæpius purpurascentibus integerrimis ciliatis, floribus terminalibus breve pedicellatis, calyce urceolato setis simplicibus penicillatisque tecto, laciniis 4 deciduis, appendicibus deciduis setosis apice penicillatis, antheris 8 truncatis.—O. octandra. *D C. Prod. III. p.* 142? (vix *Linn.*)—In insula Ceylano. Affinis quod ad antheras *O. truncatæ*, at suffruticosa parva, foliis 3—4-lineas tantum longis.

3. O. *buxifolia* (Arn.); fruticosa humilis ramosa, ramulis ferrugineo-villosis foliis approximatis setis pluribus stipulatis subsessilibus rigidis crassiusculis subrotundato-ovatis recurvis basi cordato-cucullatis apice emarginatis margine revolutis supra glabris confertim striolatis impresso-5-nervibus subtus ad nervos præcipue ferrugineo-villosis, floribus (magnis) terminalibus sessilibus subsolitariis, calyce basi setis suffulto squamis penicillatim villoso-pilosis subsessilibus stipitatisve densissime tecto, laciniis 5 lanceolatis deciduis, appendicibus linearibus deciduis pilosis apice penicillatis, antheris 10 breviter acuminatis stylum filiformem apice incurvum subæquantibus, fructu cupulato apice dense villoso.—Melastoma basifolia, *Moon. Cat. Ceyl. Fl. p.* 35.—In monte "Adam's Peak" insula Ceylani, ad alt. 8000 ped.

This is one of the most distinct and handsome of the genus.

4. O. *rubicunda* (Arn.); fruticosa ramosa, ramis setis brevibus scabris, foliis petiolatis ovatis ovalibus vel oblongis obtusiusculis 5-nervibus supra strigoso-hispidulis subtus ad nervos hirsutis inter eos hirsute pubescentibus, floribus capitatis sessilibus bracteatis, calyce squamis subsessilibus vel breviuscule stipitatis palmatim pilosis purpurascentibus densissime tecto, laciniis 5 deciduis lanceolatis ciliatis, appendicibus linearibus deciduis setiferis, antheris 10 lineari-oblongis vix acuminatis, stylo subincurvo clavato, ovario breviter turbinato.—In Ceylani montibus ad alt. 6000 ped.

Vix varietatem *O. Wightianæ*, quam etiam in Ceylano lectam vidi, esse credo, at habitu in exemplis suppetentibus alieno characteribus tamen ninis affinem concedo. Folia in *O. rubicunda* sunt, supra atro-viridia, utrinque magis hispida, petiolo semipollicari, et calycis squamarum setæ petentes rubicundæ; in *O. Wightiana* folia subsessilia acuta, utrinque pallida, et calycis squamæ longius stipitata, setis calyci adpressis subsericeis pallide flavescentibus.

5. O. *virgata* (Don). Huic, etiam in Ceylano insula crescenti, folia sunt demum supra fere glaberrima, et capitula subumbellata; a sequente itaque facile distinguitur.

6. O. *Kleinii* (W. et A.) fruticosa? erecta ramosa, ramis subteretibus scabris, ramulis tetragonis parce strigoso-hispidis, foliis breve petiolatis anguste elliptico-oblongis vel oblongo-lanceolatis 3—5-nerviis utrinque minute strigosis, racemis terminalibus brevibus solitariis ternisve, floribus breve pedicellatis, calyce breviter urceolato adpresse setoso apiceque versus squamulis sessilibus apice ciliatis tecto, laciniis 5 lanceolatis, appendicibus linearibus apice penicillatis, petalis calyce subduplo longioribus, antheris 10 acuminatis, stylo apice incurvo, ovario setis plurimis coronato.

α; foliis oblongo-lanceolatis 5-nerviis, calycis squamis copiosis longius ciliatis.—O. Kleinii. *Wight et Arn. Prod. Fl. Pen. Ind. Or.* 1. *p.* 323 *in adnot.*—Apud Trincomalee in insula Ceylano; *Klein.*

β; foliis anguste oblongis acutis 3-vel obscure 5-nerviis; *Burm. Thes. Zeyl. tab.* 72? — In Ceylani montibus; *D. Walker.*

7. O. *Walkeri* (Arn.); fruticosa ramosa, ramis teretiusculis breviter tomentosis, foliis breve petiolatis ovalibus obtusiusculis 3-nerviis, supra dense strigosis subtus ad nervos præcipue hirsutis, floribus terminalibus solitariis breve pedicellatis, calyce breviter cupulato setis adpressis arcte tecto, laciniis 5 lanceolato-subulatis tubum æquantibus setis tectis appendicibusque (brevibus) apice penicillatis deciduis, petalis calyce 4—5-plo longioribus, antheris 10 elongatis acuminatis stylum sub apice incurvatum subæquantibus.—In insula Ceylano, ad alt. 6000 ped.

Folia fere *O. asperæ* at flores majores et calycis laciniæ elongatæ, non ut in illa oblongæ et tubo multo breviores.

I have not as yet seen any species that seems to agree with *O. octandra* of De Candolle, unless it prove to be *O. parvifolia*. There is still greater difficulty in determining what Linnæus himself intended in the *Species Plantarum*, p. 560, he refers to his *Flora Zeylanica*, n. 173, again in that work he quotes *Melastoma scabra trinervia* of Burmann's *Thes. Zeyl.*, without any notice of the plate (tab. 72) which represents it: indeed, that figure exhibits five petals and ten stamens, and resembles *O. Kleinii* more than any species with which I am acquainted. Perhaps Linnæus' plant is *O. Ceylanica*.

I shall present abridged differential characters of all the Ceylon species :—

+ Anthers 8.

1. *O. Ceylanica*; annual, anthers subulate.

2. *O. truncata*; branches hirsute, leaves one inch to one inch and a quarter long, anthers truncated.

3. *O. parvifolia*; branches nearly glabrous, leaves three to four lines long, anthers truncated.

+ Anthers 10, acuminated.

* Leaves crowded.

4. *O. buxifolia*; leaves thick and rigid, closely striated.

** Leaves rather distant.

5. *O. rubicunda*; leaves on rather long petioles, scales of the calyx spreading, reddish, style clavate.

6. *O. Wightiana*; leaves nearly sessile, scales of the calyx adpressed, yellowish, style clavate.

7. *O. virgata*; leaves at length nearly glabrous on the upper side, flowers somewhat umbelled, style filiform.

8. *O. aspera*; branches strigose, upper side of the leaves copiously covered with adpressed bristles, under hirsute on the nerves, and harshly pubescent between them, flowers somewhat racemose, style filiform.

9. *O. Kleinii*; branches scabrous or hispid, leaves minutely strigose on both sides, flowers shortly racemose, style filiform.

10. *O. Walkeri*; branches shortly tomentose, flowers terminal, solitary, calycine segments elongated, style filiform.

In addition to the above, the only other Melastomaceous plant I have seen from Ceylon is *Melastoma Malabathrica*, L.

CHARACTERS OF NEW SPECIES OF INDIAN ACANTHACEÆ.

By Professor Ch. Gottfr. Nees von Esenbeck.

I. Ebermayera. *N. ab E.*

1. (1. *b.*)[1] E. *glauca* (N. ab E.); spicis foliosis terminalique, foliis oblongis in petiolum attenuatis glabris integerrimis, bracteis spathulato-lanceolatis patentibus calycibusque pubescenti glandulosis. *Wight, Cat. n.* 1932.—Stemodia glauca. *Herb. Klein.*

II. Adenosma. *R. Br.*

1. (1. *b.*) A. *balsamea* (Spr.); caule erecto foliisque lanceolatis calloso-dentatis glutinosis glabris, foliis axillaribus verticillatis, calycis lacinia superiore oblonga et reliquis linearibus obtusis.—*Spr. S. V.* 2. *p.* 829. *Wight, Cat. n.* 1930.—Ruellia balsamea. *Linn. f. Suppl. p.* 289.—In Indiæ Orientalis agris oryzaceis post messem vulgatissima.

III. Physichilus.[2] *N. ab E.*

Calyx profunde 5-partitus, æqualis, laciniis angustis. *Corolla* personata, palato dense bullato; labio superiore bifido, inferiori trifido. *Stamina* quatuor basi geminatim conjuncta, didyma. *Filamenta* inflexa. *Antheræ* supra basin adfixæ, lineari-oblongæ, locellis contiguis parallelis muticis, nunquam contortis; staminum breviorum minores. *Capsula* oblonga, depressa, a basi octosperma. *Semina* retinaculis squamiformibus subtensa, orbiculata, con-

[1] The numbers within parentheses denote the place which the species ought to occupy in the description of East Indian Acanthaceæ in Wallich's Pl. As. Rar. vol. 3.

[2] Nomen a φυσάω, inflo, et χεῖλος, labium.

vexo-concava, marginata. Inflorescentia: Flores *axillares, subsessiles, in spicam terminalem subsecundam exeuntes.*—Proxima *Hemiadelphi* a qua differt structura labii, staminibus quatuor perfectis et capsula tantum octosperma.

1. Ph. *Serpyllum* N. ab E.—In Mysore Peninsulæ Indiæ Orientalis, legit *J. Campbell.*

Planta humilis, diffusa, ramosa. Caulis 2—4-pollicaris, procumbens, adscendens, teretiusculus, gracilis, multinodis, glaber, ad genicula setoso-barbatus. Folia opposita, subæqualia, 3—3½ lin. longa, 1—1¼ lin. lata, subsessilia, sæpe secunda et reflexa, oblongo-lanceolata, acuta, integerrima, utrinque uti et bracteolæ et calyces setis albis hirsuta, supra lineolata. Flores in axillis foliorum alternis sessiles, inferiores distantes, superiores denique in formam spicæ subsecundæ contiguæ, foliis simul paulo decrescentibus. Bracteolæ calycem æquantes, lanceolatæ, obtusæ. Calyx 2¼ lin. longus, usque ad basin fere 5-partitus, laciniis æqualibus, anguste linearibus obtusis. Corolla 5—5½ lin. longa, carnea (?), pubescens, venulosa; tubus angustus, longitudine calycis; faux brevis, inflata; labium superius ovatum, latere reflexum, bifidum, laciniis ovatis obtusis; labium inferius paullo longius, subrotundum, palato valde inflato fauces claudente, undique supra bullulis obtusis, subtus foveis obsito, limbo trifido laciniis brevibus æqualibus obtusis. Stamina quatuor, inclusa, tubi apici inserta, didyma, majori altero alteroque duplo breviori basi connexis; filamenta tenuia, glabra, primo inflexa; antheræ lineari-oblongæ, infra medium adfixæ, locellis ob connectivum angustissimum contiguis æqualibus omnino glabris utroque fine obtusis post pollen emissum haud contortis. Stylus filiformis pubescens; stigma simplex, acutiusculum. Capsula duas lineas longa, oblongo-lanceolata, acutiuscula, ad septum depressa, pubescens, a basi bilocularis septo persistente, a basi seminifera. Semina in locello quoque quatuor, distantia, parva, orbiculata, hinc concava, inde convexa, margine angusto hyalino cincta. Retinacula brevia, obtusa.

IV. Gymnostachyum. *N. ab E.*

1. G. *Ceylanicum* (N. ab E.); floribus in racemo fasciculatis fasciculis distantibus, pedicellis lateralibus bibracteolatis, foliis oblongo-ovalibus obtusis basi acutis subtus tenuissime pubescenti-tomentosis, antheris ovalibus basi unicalcaratis.—In Ceylano insula. *D. Walker.*

V. Barleria. *Linn., N. ab E.*

1. (13. *b.*) B. *Arnottiana* (N. ab E.); subdiandra, herbacea, appresso-strigosa, foliis ellipticis utrinque attenuatis, pedunculis axillaribus brevissimis tri-abortu unifloris, bracteolis oblongis integerrimis, calycis laciniis majoribus ovalibus obtusis vel acutiusculis integerrimis strigosis, inferiori paullo minori retusa.—In Ceylano insula. *D. Walker.*

2. (13. *c.*) B. *Macræi* (Arn.); tetrandra, herbacea, parce adpresso-strigosa, foliis ovato-acuminatis basi acutis, pedunculis axillaribus brevibus trifloris, bracteolis lineari-lanceolatis, calycis laciniis majoribus lanceolato-attenuatis strigosissimis, inferiori paullo minore bidentata.—In insula Ceylano. *Macræ; Walker.*

VI. Lepidagathis. *W.*

1. (7. *b.*) L. *Ceylanica* (N. ab E.); caule herbaceo trichotomo-ramosissimo subdiffuso foliisque oblongis utrinque attenuatis subrepandis glabris, spicis terminalibus in pedunculis bi- trifidis congestis, bracteis communibus conformibus ovalibus mucronatis trinervibus bracteolisque lineari-lanceolatis calycisque laciniis mucronulato-acutis subtilissime ciliolatis pilisque raris glandulosis inspersis submembranaceis.—L. Javanica β. *Blume, Bydr. p.* 802. —β, bracteis minoribus oblongis, spicis minoribus, foliis basi maxime attenuatis.—In Ceylano insula legit var. β. *Dom. Walker.*

VII. Ruellia. *Lin.; N. ab E.*

1. (3. *b.*) R. *dura* (N. ab. E.); caule procumbente hispido, foliis . . . . ., spicis axillaribus brevissime pedunculatis cernuis capituliformibus, bracteis quatuor majoribus subovatis acutiusculis crassis e

tuberculis hirsutis subtusque tomentosis involucratis, communibus interioribus oblongo-lanceolatis propriis linearibus nullisve, capsula 8-sperma calyce breviore.—In præsidio Madraspatana legit *J. Campbell.*

2. (3. *c.*) R. *erecta* (Roth); caule erecto pubescenti-cano, foliis ovato-ellipticis obtusis basi acutis subcrenulatis utrinque hirtis, floribus subternis corymboso-subsessilibus, corolla tubuloso-infundibuliformi.—R. crispa, *Wight, cat. n.* 1941 (ex parte.)

Legit in Indiæ Or. Penins. *Wight;* in Paghamew, *Gomez.*

VIII. Strobilanthes. *Bl.*

1. (7. *b.*) Str. *Walkeri* (Arn.); caule fruticoso glabro aspero, foliis ovalibus acuminatis basi acutis undulato-crenulatis utrinque scabris, capitulis axillaribus oppositis terminalibusque ovatis brevepedunculatis paucifloris, pedunculis 1—3-floris, bracteis ovalibus bullato-rugosis, staminibus exsertis.—In Ceylano insula legit *D. Walker.*

2. (10. *b.*) Str. *Hookeri* (N. ab E.); caule herbaceo aspero ad genicula hirsuto, foliis oblongis acuminatis in petiolum brevem decurrentibus crenato-denticulatis supra sparsim subtus densius hirsutis, spicis axillaribus simplicibus ovalibus erectis glabris, pedunculo crasso petiolo longiore, bracteis late orbiculatis patulo-ventricosis amplectentibus infimis minoribus reflexis, laciniis calycis lanceolatis acutis dorso medio inferius hirsuto.—In insula Ceylano. *D. Walker; Macrae.*

3. (10. *c.*) Str. *calycina* (N. ab E.); caule suffruticoso strigoso, foliis subovalibus acuminatis in petiolum decurrentibus obiter crenato-denticulatis hirsutis, spicis axillaribus brevipedunculatis nutantibus dein erectis ovalibus simplicibus, pedunculo bibracteato petiolo breviori, bracteis spicæ omnibus imbricatis basi cuneiformibus apicem versus coloratis mucronulo denticulisque nonnullis exiguis præditis, calyce corollam æquante laciniis æqualibus latiuscule lanceolatis acutis—*β.* caule lævi et glabro.—In Ceylano insula. *Dom. Walker.*

4. (10. *d.*) Str. *trifida* (N. ab E.); caule herbaceo strigoso, foliis ellipticis in petiolum folio breviorem alatim decurrentibus crenatis supra glabris subtus ad venas pilosis, pedunculis axillaribus folio longioribus trichotomis, spicis ovatis paucifloris, bracteis late ovalibus ventricosis, inferioribus remotioribus minoribus ramuligeris reflexis.—In Ceylano insula. *Dom. Walker.*

5. (11. *b.*) Str. *sexennis* (N. ab E.); caule fruticoso tetragono articulis inferius cingulato-rugosis, foliis oblongis utrinque attenuatis acute serratis inferioribus longe petiolatis superioribus sessilibus basi subdilatata amplectentibus, pedunculis axillaribus bi- trifidis folium subæquantibus spicisque oblongis subsecundis setoso-glandulosis, bracteis ovatis acutis, corolla calyce subtriplo longiore incurva laciniis emarginatis.—In Ceylano insula. *D. Walker.*—Non nisi sexto quoque anno floret.

6. (13. *b.*) Str. *colorata* (N. ab E.); herbacea, erecta, caule glabriusculo, foliis ovalibus utrinque attenuatis crenatis hirsutis, spicis axillaribus compositis pedunculatis ovatis simplicibus folio brevioribus, bracteis obovato-cuneatis glanduloso-hirsutis superne coloratis.—In Ceylano insula. *Dom. Walker.*

7. (14. *b.*) Str. *Arnottiana* (N. ab E.); tota e tuberculis hispida, caule herbaceo suberecto, foliis ovalibus denticulatis acuminatis acumine obtusiusculo basi obtusis, pedunculis axillaribus folio longioribus flexuosis foliosis simplicibus trifidisve, spicis ovalibus cernuis, bracteis ovalibus obtusis herbaceis calycibusque densius strigosis.—In insula Ceylano. *Dom. Walker.*

8. (15. *a.*) Str. *anceps* (N. ab E.); fruticulosa (?), foliis ovatis acuminato-obtusiusculis basi obtusis subdenticulatis supra scabris subtus pilosis bracteisque et calycibus glanduloso-punctatis, pedunculis axillaribus terminalibusque simplicibus trifidisve superne bialato-ancipitibus stricte erectis, spicis subcylindricis, bracteis ovatis late petiolatis apice squarroso-patentibus calycibusque hirsutis, capsulis setoso-glandulosis.—In Ceylano insula. *D. Walker.*

Ante *Str. Sabinianam* ponenda.

9. (18. *b.*) Str. *hirsutissima* (N. ab E.); herbacea, erecta, undique densissime glanduloso-hirsuta, foliis (floralibus) ovali-oblongis sessilibus, spicis axillaribus terminalibusque bifidis erectis dissitifloris, floribus oppositis secundis, calycibus articulos subæquantibus bractea ovali duplo longioribus.—In Ceylano insula. *Dom. Walker.*

IX. Goldfussia. *N. ab E.*

1. (9. *b.*) G. *paniculata* (N. ab E.); caule herbaceo tetragono, foliisque ovalibus caudato-acuminatis inæqualiter crenato-denticulatis glabris, spicis subglobosis parvis in ramis panicularibus trifidis, bracteis parvis ovali-oblongis bracteolisque et calycis laciniis lanceolato-oblongis obtusis rigidis apicem versus lacero-ciliolatis, corollæ laciniis bifidis.—In insula Java.

Post *G. pentastemoidem* ponenda.

X. Leptacanthus. *N. ab E.*

1. (2.) L. *Walkeri* (N. ab E.); panicula dense glanduloso-villosa, perianthii laciniis lineari-filiformibus superiori paullo longiori, foliis caulinis ovali-oblongis subtus pubescentibus, floralibus ovato-acuminatis minimis.[1]—In Ceylano insula.

XI. Endopogon. *N. ab E.*

1. (4.) E. *viscosus* (Arn.); bracteis oblongo-lanceolatis obtuse unguiculato-cuspidatis carinatis rigidis hirsuto-glandulosis, foliis ovali-oblongis ovalibusque utrinque attenuatis hispidis, seminibus ovatis.—α; *viscosissimus;* spicis densissime villosis, foliis superioribus brevioribus ovalibus utrinque breviacutatis supra strigillosis.—β; *hispidus;* spicis hispidulo-viscosis, foliis ovali-oblongis utrinque attenuatis hispidissimis.—Justicia viscosa. *Moon, Cat. Ceyl. Fl.*—Crescit α et β promiscue in Ceylano insula. *D. Walker.*

XII. Rungia. *N. ab E.*

1. (3. *b.*) R. *longifolia* (N. ab E.); bracteis sterilibus oblongis acutis anguste marginatis, fertilibus bracteolisque ovalibus late marginatis ciliatis obtusis, foliis lanceolato-linearibus obtusiusculis glabris inferioribus paullo latioribus, pedunculis axillaribus oppositis solitariis geminisve, altero mono- altero distachyo, corolla bractea longiore labio superiori acuto.—In Ceylano insula. *D. Walker; Wight.*

2. (5. *b.*) R. *latior* (N. ab E.); bracteis conformibus obovatis retusis brevissime mucronulatis subtrinervibus ciliatis margine membranaceis, bracteolis subulatis, foliis ovalibus utrinque modice attenuatis obtusiusculis, caule repente diffuso, corolla bracteas excedente labio superiore acuto.—In Ceylano insula. *D. Walker.*

XIII. Andrographis. *N. ab E.*

1. (3. *b.*) A. *Ceylanica* (N. ab E.); herbacea, caule hirtulo, foliis oblongis brevissime petiolatis supra strigosis subtus pubescentibus, racemis axillaribus terminalique dimidiatis glanduloso-pubescentibus, floribus longiuscule pedicellatis, laciniis calycis subulatis, capsula.—In Ceylano insula. *Walker; Wight.*

Breslau, June 11th, 1836.

[1] The capsule of this species is in shape a double cone, and contains four seeds. (G. A. W. A.)

SYNOPSIS OF THE EAST INDIAN SPECIES OF DROSERA AND PARNASSIA.

By G. A. Walker Arnott.

Drosera. *Linn.*

§ 1. rocella. *D C.*

1. D. *umbellata* (Lour.); acaulis, foliis ovalibus longe petiolatis, scapo apice umbellato 5-floro.—*Lour. Coch.* (*ed. Willd.*) 1. *p.* 232. *D C. Prod.* 1. *p.* 317. *Don in Mill. Dict.* 1. *p.* 344.

Hab. In China.

This I have not seen, nor am I aware of its existence in any Herbarium. Loureiro himself had never found either the recent flowers or the fruit, and is somewhat doubtful about the genus, although the appearance was that of a *Drosera.*

2. D. *Burmanni* (Vahl); acaulis, foliis cuneato-obovatis sessilibus reticulato-venosis, scapo paucifloro erecto capillari

calyceque glabris, seminibus exarillatis.—*Vahl, Symb.* 3. *p.* 50. *D C. Prod.* 1. *p.* 318. *Don in Mill. Dict.* 1. *p.* 344. *Roxb. Fl. Ind.* 2. *p.* 113. *Moon, Cat. Ceyl. Pl. p.* 23. *Wight et Arn. Prod. Fl. Pen. Ind. Or.* 1. *p.* 34. *Wall. Cat. n.* 1242. *Wight Cat. n.* 120.—*Burm. Th. Zeyl. t.* 94. *f.* 2.

Hab. In Ceylon. *Hermann, Burmann, Moon, Macrae, Walker.* Peninsula of India. *Roxburgh, Heyne, Klein, Wight, Griffith.* Bengal and Silhet. *Wallich, Hamilton, De Silva.* Cochinchina? *Finlayson.*

3. D. *Loureirii* (Hook. et Arn.); acaulis, foliis oblongo-spathulatis in petiolum subæque longum pilosum attenuatis, scapo adscendente elongato plurifloro folia multo superante versus apicem calyceque glanduloso-pubescentibus, pedicellis calycem æquantibus, seminibus exarillatis.—*H. et A. in Bot. Beech. Voy. p.* 167. *tab.* 31.—D. rotundifolia. *Lour. Coch. (ed. Willd.)* 1. *p.* 233.—D. Burmanni. *D C. Prod.* 1. *p.* 318 (quoad plantam Chinensem).

Hab. Cochinchina. *Loureiro.* Canton, China. *Messrs. Lay and Collie.*

4. D. *Indica* (Linn.); caule ramoso, foliis sparsis anguste linearibus apice attenuatis glanduloso-pilosis, pilis limbi latitudine longioribus rigidiusculis, petiolo brevi glabro vel minute puberulo latitudine limbum folii subæquante, racemo paucifloro calyceque copiose patentim glanduloso-pubescentibus, seminibus exarillatis.—*Linn. Sp. p.* 403. *D C. Prod.* 1. *p.* 319. *Don in Mill. Dict.* 1. *p.* 346. *Roxb. Fl. Ind.* 2. *p.* 113. *Moon, Cat. Ceyl. Fl. p.* 23. *Wight et Arn. Prod. Fl. Pen. Ind. Or.* 1. *p.* 34. *Wall. Cat. n.* 1244. *Wight, Cat. n.* 119.—*Rheed. H. Mal.* 10. *t.* 20. *Burm. Zeyl. t.* 94. *f.* 1.

Hab. Ceylon. *Hermann, Burmann, Moon, Macrae, Walker.* Peninsula of India. *Roxburgh, Klein, Heyne, Wight, Campbell.* Tavoy. *Gomez.*

5. D. *Finlaysoni* (Wall.); caule ramoso, foliis sparsis anguste linearibus longe subulato-attenuatis supra margineque breviter articulato-pilosis, petiolo subæquilato brevi, racemis elongatis multifloris minutissime parceque glanduloso-puberulis, seminibus ovoideis scrobiculato-punctatis. *Wall. Cat. n.* 3752.

Hab. Turow Bay, Cochinchina. *Finlayson.*

This is much larger than the preceding, and presents a considerable difference in habit, but approaches too closely in character. I have only seen one specimen, and that an imperfect one.

§ 2. ERGALEIUM. *D C.*

6. D. *lunata* (Ham.); caule erecto glabro, foliis radicalibus rotundato-reniformibus, caulinis sparsis petiolatis peltatis lunato-triangularibus, angulis duobus acuminatis tertio rotundato, sepalis lacero-dentatis ciliatisve cæteroquin glabris, seminibus exarillatis.—*Ham. in D C. Prod.* 1. *p.* 319. *Don Prod. Fl. Nep. p.* 212. *G. Don in Mill. Dict.* 1. *p.* 346. *Moon, Cat. Ceyl. Fl. p.* 23. *Wall. Cat. n.* 1243.—D. peltata. *Wight et Arn. Prod. Fl. Pen. Ind. Or.* 1. *p.* 34. *Wight, Cat. n.* 117.

Hab. Ceylon. *Moon, Walker.* Peninsula of India. *Wight.* Nepal. *Hamilton, Wallich.* Himalayah. *Gerard.* Silhet. *Bruce.*

Although I have here kept *D. lunata* distinct from *D. peltata,* I do so with much hesitation; and the doubts, expressed by Dr. Wight and myself in the Prodromus Fl. Penins., are somewhat confirmed by specimens from Van Diemen's Land, agreeing entirely with the above character. The only difference I can point out between the two species is, that in our plant the calyx is glabrous; the margin is usually slightly cut or toothed, although sometimes ciliated. In *D. peltata* the calyx is all over covered with adpressed longish hairs, and the sepals are broader and shorter than in *D. lunata.* If they be really distinct species, it is not easy to say to which Smith's and Labillardière's synonyms belong.

Parnassia. *Linn.*

This genus may be conveniently divided into four groups, two of which belong to Europe, N. America, and Siberia; the other two to East India. I shall here give

the definitions of each, with an enumeration of all the species I possess.

§ 1. *Stamina sterilia in setas graciles apice glanduliferas desinentia; petala margine integerrima.*

P. Caroliniana. *Mich.*—P. palustris. *Lin.*—P. parviflora. *D C., Hook. Fl. Bor. Am.* 1. *t.* 27.—P. Kotzebuei. *Ch. et Schl.*

§ 2. *Stamina sterilia in setas validas apice glanduliferas desinentia; petala basin versus fimbriato-lacera.*

1. P. *Wightiana* (Wall.); foliis late cordato-ovatis subreniformibus, sinu subrotundato, bractea foliis simili amplectente, petalis obovato-oblongis margine infra medium in segmenta simplicia vel simpliciter furcata tenuia ciliato-laceris, ungue brevi late cuneato, staminibus sterilibus fertilia subæquantibus in setas validas apice glanduliferas desinentibus.—*Wall. Cat. n.* 3755. *Wight et Arn. Prod. Fl. Pen. Ind. Or. p.* 35. *Wight, Cat. n.* 116.

Hab. Mountains in the South of the Peninsula of India. *Wight.*

Scapus subpedalis. Folia 1¼ poll. longa, 1½ fere lata.

2. P. *ornata* (Wall.); foliis late cordato-ovatis sinu angusto, bractea consimili amplectente, petalis obovatis basi in unguem conspicue uninervem late linearem angustatis basin versus ungueque copiose ciliato-laceris, laciniis elongatis capillaceo-pinnatisectis, staminibus sterilibus in setas validas apice glanduliferas desinentibus.—*Wall. Cat. n.* 1247.

Hab. Himalayah. *Blinkworth.*

Scapus pedalis. Folia 1½ poll. longa atque lata. Flores magni.

§ 3. *Stamina sterilia apice breviter sub-5-fida, eglandulosa; petala margine ciliato-lacera.*

P. fimbriata. *Banks.*—*Hook. Bot. Misc.* 1. *t.* 43.

§ 4. *Stamina sterilia apice brevi trifida eglandulosa; petala margine subintegerrima.*

3. P. *nubicola* (Wall.); foliis elliptico-oblongis 7—9-nerviis basi retusis et subiter in petiolum contractis, nervis subtus prominulis, bractea late ovata vel oblonga basi retusa sessili, petalis oblongis sepala subtriplo superantibus ungue brevi margine leviter dentato, staminibus sterilibus dimidio brevioribus apice trilobis, lobis crassis oblongis obtusis.—*Wall. Cat. n.* 1246.

Hab. Gossain-Than. *Wallich.* Kamaon. *Blinkworth.*

Scapus plusquam pedalis. Folia 2½—4 poll. longa, 1½ lata. In hac atque in speciebus duabus sequentibus tria tantum stigmata vidi. Flores majusculi.

4. P. *Mysorensis* (Heyne); foliis cordatis subreniformibus lobis incumbentibus, bractea cordata amplectente, sepalis late ovalibus pedunculi apice incrassato dimidio longioribus, petalis obovali-oblongis unguiculatis margine integerrimis subdenticulatisve sepala 2½-plo superantibus, staminibus sterilibus fertilibus dimidio brevioribus apice trifidis segmentis oblongis obtusis crassiusculis.—*Heyne in Wall. Cat. n.* 3754. *Wight et Arn. Prod. Fl. Pen. Ind. Or. p.* 35.

Hab. Mysore. *Heyne.*

Scapus 3—3½ pollicaris. Folia 4—5½ lin. longa, 3¾ lata. A *P. Kotzebuei*, cui habitu quod ammodo similis, differt petalis calyce longioribus, staminum sterilium forma, bractea sessili, foliorumque forma.

5. P. *pusilla* (Wall.); foliis cordato-ovatis lobis divergentibus, bractea ovata subpetiolata, sepalis late ovalibus pedunculi apicem incrassatam æquantibus, petalis obovatis basi sensim in unguem sepala æquantem attenuatis integerrimis sepala 3—4-plo superantibus, staminibus sterilibus apice breviter trifidis fertilia ac sepala subæquantibus.—*Wall. Cat. n.* 1255.

Hab. Gossain-Than. *Wallich.*

Scapus 2½—3-pollicaris. Folia 3 lin. tantum longa, 2¼—2½ lata.

NOTES ON A COLLECTION OF PLANTS MADE IN THE PROVINCE OF ASTURIAS, IN THE YEAR 1835, BY M. DURIEU.

By N. I. Winch, Esq., F.L.S., &c. &c. &c.

On referring to Vol. I. p. 187 of this work, a short notice of Mr. Durieu's botanical discoveries in Spain will be found,

and at p. 212 several interesting letters on the same subject. Since that period, M. Gay of Paris has commenced the publication of Durieu's "*Iter Asturicum*" in the "*Annales des Sciences Naturelles*," Paris, for August and September, 1836, p. 113 and 129, which is to be continued.

Having been so fortunate as to procure one of the collections made during this excursion, and hoping that any information respecting a country so little known to British Botanists may prove interesting, I now venture to submit these brief notes to the public, as a trifling contribution to the Geography of plants. It may here be necessary to observe, that as yet M. Gay has touched but slightly on this branch of his subject, confining himself to remarking the precise localities of the rare species for the benefit of future Botanists; though it is likely his essay will be concluded by a series of general remarks. To save the reader the trouble of consulting his Atlas, it may be as well to notice, that the Province of Asturias forms the North coast of Spain from Biscay to Galicia, a distance of about one hundred and fifty British miles, its greatest breadth from Cape de Penas to Leon being between sixty and seventy miles. From that province it is divided by a lofty branch of the Pyrenées, Sierra Alba situated near the eastern extremity of the range, being 6,960 feet in height, Sierra Penamarella at the western extremity, 9,450 feet, and Neas Pagaris holding a place nearly equidistant between them, 2,628 feet. Here the line of perpetual snow is 7,200 feet. On Arvas, a mountain peculiarly rich in plants, Mr. Durieu found the snow to be melted in July. Asturias is about six degrees South of the Land's-end in Cornwall, and its longitude the same as that of Ireland. In the collection of plants which forms the subject of these remarks, are comprised one hundred and forty-one specimens of cellular, and twenty-one of vascular, cryptogamic species; sixty-five of Monocotyledones, and one hundred and eighty-five of Dicotyledones, in all four hundred and twelve species or well-marked varieties; they were named by M. Gay, which places the correctness of their appellations beyond dispute. Of three Fungi, one is peculiar to the Peninsula, and the other two to the North of Europe. The *Algæ*, which are particularly fine when compared with those of the German Ocean, are forty-three in number, four or five only have not been collected on the British coasts. We have all the Lichens but one, out of sixteen, and that, though *Umbilicaria*, a plant not likely to be overlooked, ranges from Lapland to Spain, no Botanist has been so fortunate as to find it with us. Of twenty one *Hepaticæ*, five only have not been detected in these kingdoms. And the same may be said of six Mosses out of fifty-eight. We have also nineteen of the twenty-one Filices, but one exception is remarkable. I allude to *Woodwardia radicans*, which reaches the North of Spain from Madeira and Teneriffe, a Fern with the size and appearance of a tropical production. On examining the flowering plants, it immediately becomes evident that the natives of the South begin to predominate, for even among the sixty-five Monocotyledons only twenty-eight are British, and of one hundred and eighty-five Dicotyledons, fifty-two alone are known as indigenous with us, or in Ireland. Yet we should not consider this as the just proportions between the Flora of Asturias and our own, for Mr. Durieu, a French Botanist, would be more likely to collect the southern species in preference to the well-known ones of the middle of Europe, so common in France and Britain.

Before concluding, it may be thought necessary that something should be said respecting those rare species which the South-West and West of England, and more particularly the West of Ireland, are conjectured to owe to the Pyrenean Flora. The following short lists will serve to point out to what extent we are possibly indebted to Spain for some of our scarce plants; and it is worthy of notice, that a few of these even reach the South-West of Scotland, but always ranging on the western coast of our island.

South and South-West of England.	*Ireland.*
Briza minor	
Pinguicula Lusitanica..................	Dublin county and the S.W. of Scotland.
....	Pinguicula grandiflora, Kerry mountains.
Polycarpon tetraphyllum	
Corrigiola littoralis	
Exacum filiforme	Bantry.
Campanula hederacea	In the county of Cork.
Saxifraga umbrosa—very doubtful if a native.	In the Kerry mountains, with its var. *serrata*, together with Saxifraga Geum and S. hirsutum.
Erica vagans	Said to have been found on the Waterford coast.
—— ciliata	
....	Erica Mackaii Cunnamara.
....	—— Mediterranea. Ditto, but not in Asturias.
....	Menziesia Dabeoci. Ditto.
....	Arbutus Unedo. Kerry.
Sibthorpia Europæa	Wicklow, one habitat.
Scrophularia Scorodonia	Tralee, but doubtful.
Asplenium lanceolatum. Kent.........	

Cryptogamia.

I. Fungi.

1. Antennaria eriocephala. *Link.* E. pinophylla. *Nees.* On Heath and Pines in Portugal and Spain. Most probably the range of this obscure cryptogamic plant is to the South.

2. Peziza bicolor. Not rare on dead sticks in the North of England, &c.

3. Æcidium cornutum. I have specimens of this singular species growing on the leaves of the mountain Ash, from the North of Norway, and I have gathered it in Sweden, the North of England, and Switzerland.

II. Algæ.

1. Conferva scutellata. *Eng. Bot.* 2311. Not rare on Himanthalia lorea.

2. C. flexuosa. *Eng. Bot.* 1944. *α.* Frequent in fresh water, and *β.* in salt water ditches.

3. Spongidium dichotomum. *Lam.* Codium tomentosum. *Agardh.* Ireland, Cornwall, Iona, and the coast of Durham.

4. Dictyota linearis. Not British.

5. D. dichotoma. Devon, Ireland, and Scotland.

6. Borya nodulosa. *Grat.* Ceramium rubrum. *Agardh.* Britain and Ireland common.

7. Ceramium coccineum. Britain and Ireland, common.

8. Hutchinsia violacea. *Lyngb.* Polysiphonia violacea. *Greville.* Coast of Durham.

9. Cladostephus equisitifolius. Not British.

10. C. Myriophyllum. *Ag.* C. verticillatus. *Lyngb.* Britain and Ireland.

11. Sphacelaria scoparia. Frequent.

12. Rhodomela scorpioides. *Ag.* South East coast of England.

13. Plocamium vulgare. *Lam.* Frequent.

14. P. cristatum. Not British.

15. Sphærococcus laciniatus. Britain and Ireland.

16. S. coronopifolius. *Ag.* South of England, Ireland, and the Isle of Bute.

17. Dawsonia lacerata. Delesseria lacerata, *Ag.* Britain and Ireland, frequent.

18. Sphærococcus Palmetta. Britain and Ireland, rare.

19. S. confervoides, ♂. Britain.

20. S. elongatus. Not British.

21. S. jubatus. South of England and Ireland.

22. Chondrus polymorphus. Sphærococcus crispus. Common.

23. Gelidium maximum. Sphærococcus corneus, β. South of England and Ireland.

24. Dictyopteris elongata. *Lam.* Haliseris polypodioides. *Ag.* South of England, rare.

25. Lomentaria articulata. Frequent.

26. L. Opuntia. Britain.

27. Lichina affinis. *Ag.* Not rare.

28. L. pygmæa. *Ag.* Not rare.

29. Clavatella viridissima. *Bory.* Not British.

30. Cystoseira fibrosa. The South and East coast of England.

31. C. species nova.

32. Siliquaria angustata. *Bory.* Fucus siliculosus. *Stack.* Britain and Ireland. Non F. siliquosus. *Linn.*, (*Gay.*)

33. Desmarestia aculeata. *Lam.* Sporochnus aculeatus. Common.

34. Gigartina pectinata. Fucus plumosus, β. *Turner Hist.* Britain and Ireland.

35. Halymenia composita. Sphæracoccus ciliatus, β. *Ag.* South of England.

36. H. palmata. *Ag.* Britain and Ireland, frequent.

37. Scytosiphon filum. *Ag.* Britain and Ireland, not rare.

38. Fucus serratus. Common.

39. F. vesiculosus. *Bory.* Britain. Probably a var. of our F. vesiculosus.

40. F. tuberculatus. South of England and Ireland.

41. F. canaliculatus. Common.

42. F. disciplinatus. *Bory.* Not British?

43. Species nova.

III. LICHENES.

1. Peltigera crocea. Solorina crocea. *Ach.* Lapland, Norway, Swiss Alps, and near the summit of Ben Lawers and other Highland mountains.

2. Umbilicaria cylindrica. In the same localities; also on the mountains of Wales, Ireland, and the North of England.

3. U. erosa. The same localities.

4. U. polyphylla. The same. In fructification in the county of Durham.

5. U. pustulata. The same localities, but never found in the county of Durham, and very rare in Cumberland and Northumberland.

6. U. vellea, α. and β. From the sea-coast to the Alps of Asturias.

This beautiful Lichen has been found from Lapland to Spain, but not in Britain nor Ireland. On the Swiss Alps it is very fine.

7. Parmelia plumbea.

8. P. hypnorum.

The former on the bark of trees, the latter on moss, both on the Continent, in Britain and Ireland.

9. P. tartarea. On rocks, particularly in sub-alpine countries.

10. Cornicularia lanata. In alpine situations, both on the Continent and Britain.

11. Endocarpon miniatum, β. On rocks in sub-alpine situations, both in Britain and on the Continent.

12. Cladonia bellidifolia. On moors and mountains, growing as far North as Greenland.

13. Stereocaulon nanum. *Sch.* Probably a var. of *S. paschale.* In similar situations.

14. S. coralloides. Localities the same.

15. Cornicularia tristis. A more alpine plant than the last, in Northumberland and Durham, rare.

16. Sticta pulmonacea. On old trees in Britain and Ireland in mountainous situations, and not rare on the Continent.

IV. HEPATICÆ.

1. Anthoceros punctatus. *Linn.* Britain, &c.

2. Targionia hypophylla. *Mich.* England, Scotland, and the Continent.

3. Marchantia commutata. *Lindenb.* Not detected in Britain.

4. Jungermannia pinguis. British.

5. J. crenulata, α. and β. Ditto.

6. J. undulata. Ditto.

7. J. bicuspidata. British.

8. J. concinnata. *Light.* Ditto.

9. J. connivens. *Dicks.* Ditto.

10. J. serpyllifolia. Ditto.

11. J. polyanthos, var. rivularis. *Lindenb.* Not yet detected in Britain.

12. J. quinquedentata. Britain.

13. J. lævigata, Borrowdale, Cumberland, &c.

14. J. tomentella, county of Durham.

15. J. trilobata. Britain.

16. J. tamarisci. Ditto.

17. J. emarginata. Ditto.

18. J. undulata. Ditto.

19. J. platyphylloides. *Schw.* Not yet found in Britain.

20. J. Schraderi. *Mart.* Ditto.

21. J. bicrenata. *Lindenb.* Ditto.

V. MUSCI.

1. Andræa rupestris. On alpine rocks both in Britain and the Continent.

2. A. Rothii. Ditto.

3. Sphagnum acutifolium. Britain and the Continent.

4. Gymnostomum fasciculare. Ditto.

5. Zygodon viridissimum. *Bory.* Gymnostomum viridissimum. *Hook.* Ditto.

6. Splachnum ampullaceum. Britain and the Continent.

7. Diphyscium foliosum. In sub-alpine situations, Britain and the Continent.

8. Schistidium ciliatum. In similar situations.

9. Polytrichum commune. Frequent.

10. P. alpinum. Generally on alpine mountains. Britain and the Continent. Northumberland and Durham.

11. Barbula cuneifolia. The South of England and Ireland.

12. Grimmia gracilis. *Schrad.* G. Apocarpa. var. Ditto.

13. G. rivularis. G. apocarpa *var.* Britain and the Continent, not rare.

14. Conscinodon verticillatus. *Brid.* Generally in springs containing lime, Britain and the Continent.

15. Weissia controversa. Not rare.

16. W. fugax. *Hedw.* W. stricta. *Hook.* On alpine rocks, rare.

17. W. recurvirostra. In the North of England, not rare.

18. Dicranum Starkii. On alpine rocks rare.

19. D. heteromallum. Frequent.

20. D. scoparium. Ditto.

21. D. pellucidum. *Hedw.* By streams, not rare.

22. Trichostomum crispatum. *Bruch.* Didymodon crispulus. *Hook.* Wales and the Island of Anglesea.

23. Racomitrium heterostichum. *Brid.* On rocks.

24. R. aciculare. In mountainous districts.

25. R. polyphyllum. In similar situations, particularly abundant in the vicinity of the lakes of Cumberland and Westmoreland.

26. Dryptodon pulvinatus. *Brid.* Common.

27. D. patens. On the Scotch mountains.

28. D. polycarpus. On the Scotch Alps.

29. Ceratodon purpureus. Common.

30. Didymodon heteromallus. In the North of England not rare.

31. Leucodon sciuroides. On the bark of trees, seldom in fructification in the North of England.

32. Campylopus longipilus. *Brid.* Not found in Britain.

33. Cinclidotus fontinaloides. In subalpine rivulets, abundant.

34. Fontinalis squamosa. In alpine rivulets.

35. Funaria Mühlenbergii. Chiefly in the South of England and Ireland.

36. F. Fontanesii. *Schwaegr.* Not British.

37. Orthotrichum Hutchinsiæ. Subalpine situations in Britain and Ireland.

38. O. rupestre. *Schwaegr.* In the subalpine parts of Britain.

39. O. crispum. On the bark of trees, common.

40. Leptodon Smithii. *Mohr.* On trees in the South of England.

41. Hypnum julaceum. In Britain and Ireland, rare.

42. H. longirostre. *Ehrh.* H. striatum. *Sm.* Britain, common.

43. H. strigosum. *Hoff.* I have this Moss from Sweden.

44. H. aureum. *Lag.* Sp. Nov.

45. H. rugosum. Britain, chiefly in alpine situations.

46. H. undulatum. Britain, frequent.

47. H. uncinatum. Subalpine situations, not rare.

48. H. fluitans. In marshes, frequent.

49. Pohlia elongata. *Hedw.* On subalpine mountains, not common.

50. Mnium palustre. In marshy places not rare.

51. Bryum hornum. Ditto.

52. B. nutans. Ditto.

53. B. turbinatum. Ditto.

54. B. latifolium. *Schl.* Not British.

55. B. pseudotriquetrum. Subalpine parts of Britain, frequent.

56. B. pallens. *Swartz.* I have this plant from Sweden.

57. Ptychostomum compactum. *Hornsch.* Not British.

58. Philonotis fontana. *Brid.* In marshes, frequent.

VI. FILICES.

1. Lycopodium Selago. In marshy situations, frequent.

2. Botrychium Lunaria. Britain. In the North of England, not rare.

3. Grammitis leptophylla. A plant of the South of Europe.

4. Osmunda regalis. Britain, on the western[1] side, and Ireland. Very common in Kerry.

5. Aspidium Oreopteris. Britain, especially in the North of England. Ireland.

6. A. Filix fœmina. In every wood.

7. A. Thelypteris. Britain and Ireland, but not common. Sweden.

8. A. Filix Mas. Common.

9. A. dilatatum. A. spinulosum. *Schleich.* In woods frequent.

10. A. dilatatum, var. A. spinulosum. *Swartz.* Agreeing with a Swedish species from Swartz.

[1] Not exclusively so. It is abundant in Norfolk, the most eastern county of Britain. Ed.

11. A. aculeatum. A. lobatum. *Smith.* In woods in the North of England, abundant.

12. A. angulare. A. aculeatum. *Smith.* Rare in the woods of the North, frequent in those of the South of England.

13. Asplenium Adiantum-nigrum. Frequent in the South of Europe, more rare in the North, though I have gathered it on rocks in Teesdale, and on the old walls of Newcastle; also in the West of Ireland.

14. A. lanceolatum.

15. A. lanceolatum, *var.* Willdenow mentions no other locality for this beautiful Fern than England. Cornwall, Kent, and Oxfordshire, according to Smith.

16. A. marinum. The range of this Fern is from the Canaries to the coast of Durham and Scotland; it is also met with at Howth, in Ireland.

17. Pteris crispa. In mountainous situations, chiefly on the West side of Britain; also in Ireland.

18. Blechnum spicatum. In woods, common.

19. Woodwardia radicans. The finest European Fern. Italy, Portugal, and as far South as Madeira.

20. Cystopteris fragilis. In the mountainous parts of Britain and Ireland, common.

21. Adiantum Capillus Veneris. Frequent in the South of Europe; also on the South isles of Arran, in Ireland, and near St. Ives, Cornwall.

MONOCOTYLEDONES.

I. GRAMINEÆ.

1. Phleum arenarium. On the seabeach of Britain, frequent.

2. Phalaris brachystachya. The South of Europe.

3. Agrostis capillaris. The Swiss Alps —not British.

4. A. rupestris. Ditto.

5. A. alpina, β. Lapland, Sweden, Switzerland and the Scotch Highlands.

6. A. setacea, and var. *Curtis.* In the South-West of England.

7. A. sulcata. *Gay.* Sp. Nov.

8. Avena fragilis. South of Europe.

9. Milium lendigerum. South of Europe and South of England.

10. Milium multiflorum. *Cav.* Russia, France, and South of Europe.

11. Lamarckia aurea. South of Europe.

12. Melica ciliata. Europe, but not Britain. I have gathered this handsome grass on the basaltic rocks of Ehrenbreitstein.

13. Aira flexuosa. Common.

14. Festuca Rhætica. *Sut.* South of Europe.

15. F. glauca. Frequent on the sea-coast of Britain, occasionally on the mountains.

16. F. rubra. Ditto.

17. F. rubra, var. Ditto.

18. F. spadicea. Switzerland and the South of Europe.

19. F. uniglumis. South of England, St. Vincent's rocks, Bristol.

20. F. varia, *Hænk.* South of Europe.

21. F. gigantea. Woods in Britain.

22. Poa alpina. Lapland, Switzerland, mountains of Scotland, Wales, and Ireland.

23. P. nemoralis. Woods in England. I have it also from Norway.

24. Briza maxima. South of England, but most likely introduced from the South of Europe.

25. B. minor. The South of England, rare. A plant of the South of Europe.

26. Bromus asper. Common in woods.

27. Cynosurus echinatus. Introduced into England from the South of Europe.

28. Nardus stricta. Common on moors, &c.

29. Rottböllia subulata. South of Europe.

30. R. incurvata. On the coast of Britain and Ireland, but not common.

31. Triticum Halleri, and var., *vivipera.* A grass of the South of Europe.

32. T. Rottböllii. *D C.* Ditto.

33. T. ciliatum. *D C.* Ditto.

34. T. sylvaticum, *Mœnch.* Ditto.

35. Holcus tenuis. *Gay.*

II. CYPERACEÆ.

1. Cyperus longus, β. *badius.* This var. is not indigenous in England. My specimens are from Italy.

2. Carex filifolia. *Gay.* A plant of the South of Europe.

3. C. leiocarpa. *Gay.* Ditto.

4. C. riparia. Britain, not rare.

5. C. ampullacea. Ditto.

6. C. stellulata. Ditto.

7. C. extensa. From the sea-coast, but not common in Britain. In salt marshes, Ireland.

III. TYPHINEÆ.

1. Sparganium natans. Not rare.

IV. FLUVIALES.

1. Zostera marina. In salt water ditches in Britain and Ireland.

2. Potamogeton pectinatum, P. marinum, β. *Smith.* In similar situations.

3. Ruppia rostellata. *Kock.* Sp. nov.

4. Zanichellia pedunculata. Sp. nov.

V JUNCEÆ.

1. Juncus squarrosus. On moors, frequent.

2. J. trifidus. On the Scotch Alps, in Lapland, Norway, and Switzerland.

3. J. ericetorum. *Poll.* Germany.

4. Luzula cæspitosa. *Gay.* Sp. nov.

5. L. campestris, β. In marshy places in the North of England; also in Lapland and Sweden.

6. L. lactea. South of Europe and Swiss Alps.

VI. ASPHODELEÆ.

1. Narthecium ossifragum. In subalpine boggy places, not rare. Britain and Ireland; also on the Continent.

VII. SMILACEÆ.

1. Smilax aspera. Italy and the South of Europe.

VIII. ALISMACEÆ.

1. Triglochin maritimum. Salt marshes, Britain and Ireland.

IX. COLCHICACEÆ.

1. Merendera Bulbocodium. *Ram.* S. of Europe, growing from the coast to near the summits of the Pyrenées.

X. LILIACEÆ.

1. Phalangium bicolor. *D C.* South of Europe.

2. Scilla verna. On the coast of England, Wales, and Ireland; also near Bambrough, Northumberland.

3. Allium suaveolens. South of Europe.

4. A. Schœnoprasum. South of Europe; also on basalt in Northumberland.

XI. IRIDEÆ.

1. Crocus nudiflorus. In three localities at least in England, though probably introduced. Siberia.

XII. ORCHIDEÆ.

1. Serapias cordigera. South of Europe and North of Africa.

2. S. lingua. Ditto.

3. S. occultata. *Gay.* Sp. nov.

DICOTYLEDONES.

I. CONIFERÆ.

1. Juniperus communis, *α.* alpina. From Lapland to Greece. Britain and Ireland from the sea-coast to near the summits of the highest mountains.

II. AMENTACEÆ.

1. Quercus Toza. *Bosc.* A tree of the South of Europe.

III. SANTALACEÆ.

1. Thesium pratense. *Ehrh.* Alps of the South of Europe.

IV. ELEAGNEÆ.

1. Osyris alba. South of Europe. Calabria, North of Africa.

V. POLYGONEÆ.

1. Rumex suffruticosus. *Gay.* Sp. nov.

2. R. bucephalophorus. South of Europe.

VI. CHENOPODEÆ.

1. Chenopodium portulaccoides. Salt marshes, Italy, Britain, Ireland.

2. C. maritimum. Similar localities.

3. C. ambrosioides. South of Europe.

4. Atriplex patula. Common both on the sea-shore and inland.

VII. PARONYCHIEÆ.

1. Paronychia polygonifolia. *D C.* South of Europe.

2. Herniaria Pyrenaica. *Gay.* Sp. nov.

3. Corrigiola littoralis. South-West of England, South of Europe.

4. Scleranthus annuus. Common.

5. Polycarpon tetraphyllum. South-West of England and Wales.

VIII. PLANTAGINEÆ.

1. Plantago serpentina. Alps of the South of Europe.

IX. PLUMBAGINEÆ.

1. Armeria juniperifolia. *Koch.* The same.

X. SCROPHULARINEÆ.

1. Veronica scutellata. In marshy places, Britain and Ireland.

2. Sibthorpia Europæa. Cornwall and Devon, and one habitat in Ireland.

3. Erinus alpinus. On the Swiss Alps. From the coast to the mountains in Spain.

4. Scrophularia canina. South of Europe.

5. S. Scorodonia. South of England. One habitat in Ireland?

6. S. alpestris. *Gay.* Sp. nov.

7. Linaria delphinoides. South of Europe.

8. L. triornithophora. South of Europe and Egypt.

9. L. origanifolia. *D C.* South of Europe.

10. L. supina. *Desf.* South of Europe and North of Africa.

11. L. bellidifolia. *Desf.* Ditto.

12. L. Perousii. *Gay.* Sp. nov.

13. Digitalis parviflora. South of Europe, Switzerland.

14. D. purpurea. Britain and Ireland, not rare.

XI. LABIATÆ.

1. Sideritis lurida. *Gay.* Sp. nov.

2. Galeopsis Ladanum. Britain and Ireland, particularly on a calcareous soil.

3. Acinos alpinus. From the sea-coast to the mountains. On the Swiss Alps close to perpetual snow.

4. Prunella grandiflora. Sweden and Switzerland.

XII. LENTIBULARIEÆ.

1. Pinguicula grandiflora. On the Kerry and other mountains in the South-West of Ireland abundant.

2. P. vulgaris. Britain and Ireland, common.

3. P. Lusitanica. South-West of England and of Scotland. Ireland.

XIII. BORAGINEÆ.

1. Echium plantagineum. South of Europe, Naples, Greek Islands.

2. Lithospermum prostratum. *Lois.* South of Europe.

3. Myosotis stolonifera. *Gay.* I have this plant from Astrachan, as *M. clavata* of Sprengel.

XIV. GENTIANEÆ.

1. Exacum filiforme. Cornwall and the South-West of Ireland.

XV. ERICEÆ.

1. Erica vagans. The south-western part of England, and one habitat in Ireland.

2. E. ciliaris. The south-western part of England.

3. E. arborea. The South of Europe, Switzerland.

4. E. cinerea. On every moor in Britain and Ireland.

5. E. tetralix. The same.

6. E. Mackaii. The West of Ireland.

7. E. Australis. The South of Europe.

8. Menziesia Dabeoci. West of Ireland.

9. Arbutus Unedo. On the banks of the lakes of Killarney. In Greece, on the coast of Dalmatia and in Asia minor. This beautiful tree is said to have been introduced into Kerry by the monks of St. Finnan, in the sixth century; yet when I see it associated with *Saxifraga umbrosa, S. Geum, Euphorbia Hibernica,* and *Pinguicula grandiflora,* all plants belonging to the Perynean Flora, I cannot help thinking it truly indigenous.

XVI. VACCINIEÆ.

1. Vaccinium uliginosum. On moors in the North of England and Scotland, but it does not occur in Ireland. Frequent in Lapland and Sweden; also on the Swiss Alps.

XVII. CAMPANULACEÆ.

1. Campanula Lœflingii. *Brot.*

2. C. Erinus.

Both plants of the South of Europe. Neither of them in the Swiss Flora.

3. C. hederacea. South-West of England and Ireland.

4. Phyteuma hemisphærica. South of Europe, Montanvert, and Mount St. Bernard, Switzerland.

XVIII. COMPOSITÆ.

1. Sonchus Plumieri. South of Europe. Switzerland.

2. Apargia alpina. Switzerland and the South of Europe.

3. Hieracium murorum, var. On rocks not rare.

4. H. paludosum. In damp woods.

5. Thrincia hirta. On dry banks.

6. Barkhausia albida. South of Europe.

7. Soyera lapsanoides. Ditto.

8. Tolpis barbata. Ditto.

9. Arnica montana, β. Norway. The Black Forest, Switzerland.

10. Senecio aquaticus. Both common.

11. S. Jacobæa. Ditto.

12. S. Duriæi. *Gay.* Sp. nov.

13. Carduus carlinoides. Switzerland. South of Europe.

14. Cacalia Petasites. South of Europe.

15. Filago arvensis. Common.

16. F. Gallica. A doubtful native of England.

17. Gnaphalium supinum. On the Scotch mountains, Norway, and Switzerland.

18. Erigeron acre. Britain and Ireland.

19. Conyza ambigua. South of Europe, Italy, Gibraltar.

20. C. saxatile. Ditto.

21. Buphthalmum spinosum. Ditto and Cyprus.

22. Galactites tomentosa. South of Europe.

23. Cotula coronopifolia. Italy.

24. Chrysanthemum anomalum. Ditto.

XIX. VALERIANEÆ.

1. Valeriana montana. South of Europe, Switzerland.

2. Centranthus Calcitrapa. Ditto.

XX. RUBIACEÆ.

1. Galium divaricatum. *Lam.* South of Europe.

2. G. Hercynicum. Germany, Switzerland.

3. G. ——— Sp. nov.

4. Crucianella angustifolia. South of Europe, Italy.

XXI. UMBELLIFERÆ.

1. Astrantia major. Ditto, Switzerland.

2. Eryngium Duriæi. *Gay.* Spanish Alps.

3. E. Boergati. South of Europe.

4. Bupleurum tenuissimum. England, rare. Switzerland.

5. Bunium denudatum. *D C.* South of Europe.

6. Physospermum aquilegifolium. *Koch.* Cornwall.

7. Ammi Visnaga. South of Europe.

8. Meum athamanticum. North of England and Scotland.

9. Angelica sylvestris. In every wood.

10. A. lævis. South of Europe.

11. A. pyrenaica. Ditto.

12. Laserpitium Ruthenicum, β. Ditto, Switzerland, Cyprus.

13. Chærophyllum hirsutum. Ditto, Switzerland.

XXII. SAXIFRAGEÆ.

1. Saxifraga trifurcata. South of Europe.

2. S. umbrosa, var. *serrata.* Kerry mountains, near Killarney.

3. S. Clusii. South of Europe.

4. S. stellaris. Britain, Ireland, Lapland, Norway, Switzerland.

5. S. hypnoides, var. *gemmifera.* I have seen this var in botanic gardens.

XXIII. DROSERACEÆ.

1. Drosera rotundifolia. On boggy ground in Britain and Ireland.

XXIV. CRASSULACEÆ.

1. Sedum Anglicum. Britain, especially on the western side of Ireland.

2. S. hirtum. South of Europe.

3. S. brevifolium. Ditto.

XXV. SALICARIEÆ.

1. Lythrum Græfferi. *Tenore.* South of Europe.

XXVI. ONAGRARIEÆ.

1. Epilobium origanifolium. E. alsinifolium. *Vill.* Scotch Alps.

2. E. alpinum. Lapland, Sweden, Switzerland, and on the mountains of Britain.

3. E. montanum, var. Common.

4. E. Duriæi. *Gay.* Scotland. James Dickson gave this plant, several years since, as his *E. alpestre*, it is probably a var. of *E. alsinifolium.*

XXVII. ROSACEÆ.

1. Potentilla splendens. *Ram.* South of Europe.

2. Alchemilla alpina. Lapland, Norway, Swiss Alps, and the subalpine parts of Britain and Ireland.

XXVIII. LEGUMINOSÆ.

1. Ononis reclinata. South of Europe, not reaching Switzerland.

2. Spartium album. *Desf.* Ditto.

3. Genista obtusiramea. *Gay.* Ditto.

4. G. tridentata. Ditto.

5. G. lepticlada. *Gay.* Ditto.

6. Cytisus parviflorus. *D C.* Ditto.

7. Lathyrus sphæricus. *L.* Ditto.

8. L. angulatus. Ditto.

9. L. sylvestris. Britain, as far North as Angusshire.

10. Vicia disperma. *D C.* A southern plant.

11. V. Saligii. *Gay.* Ditto.

12. Ervum tetraspermum, β. Among corn, frequent.

13. Astrolobium ebracteatum. *D C.* South of Europe.

14. Ornithopus compressus. Ditto.

15. O. roseus. *Desf.* Ditto.

16. Scorpiurus subvillosus. *Linn.* Ditto.

17. Lupinus varius. Ditto.

18. Trifolium spadiceum. Switzerland, Germany.

19. T. glomeratum. South-East of England.

20. T. angustifolium. Switzerland, South of Europe.

21. Lotus hispidus. South of Europe.

22. Medicago striata. *Bat.* Ditto. Poictiers. *De Candolle.*

XXIX. CELASTRINEÆ.

1. Rhamnus alaternus. Italy, South of Europe.

XXX. FUMARIACEÆ.

1. Fumaria capreolata. Britain, particularly in the North, and Ireland.

2. Corydalis claviculata. Ditto.

XXXI. CRUCIFERÆ.

1. Cardamine resedifolia. South of Europe.

2. Barbaræa prostrata. *Gay.* Ditto.

3. Erysimum. Sp. nov. Ditto.

4. Sinapis setigera. *Gay.* Ditto.

5. Cheiranthus linifolius. *Persoon, Syn.* 2. *p.* 200. Hesperis repanda. *D C.* Of this rare plant Persoon gives Teneriffe as the locality, De Candolle Spain. From a few seeds on my specimen, it is now growing in a gentleman's garden in this vicinity.

6. Lepidium heterophyllum. *Benth.* Spanish Alps.

7. L. alpinum. Switzerland, Tyrol, Baldo.

8. Senebiera pinnatifida. *D C.* South of Europe.

9. Alyssum montanum. *Link.* On the coast of Spain, South of Europe, Mont Echis, Greece.

10. Cochlearia Danica. Britain, Ireland, Greenland, Norway, Sweden, &c.

11. Iberis conferta. Alps, South of Europe.

12. Draba muralis. England, rare. Ireland one locality, South of Europe.

XXXII. CARYOPHYLLEÆ.

1. Dianthus pungens. South and West of France.

2. D. pungens, *var.* Ditto.

3. D. Monspessulanus. Ditto.

4. D. Gallicus. Ditto.

5. Silene macrorhiza. *Gay.* Spanish Alps.

6. S. ciliata. *D C.*

7. S. hirsuta. *Lag.* South of Europe.

8. Lychnis Corsica. *Lois.* Ditto.

9. Mœnchia quaternella. Ditto.

10. Sagina maritima. On the coasts of Britain and Ireland.

11. S. procumbens. Common.

12. Spergula sabuletorum. *Gay.* Sp. nov.

13. S. subulata. Britain and Ireland.

14. S. ramosa. *Gay.* Sp. nov.

15. S. pentandra. England ?

16. S. arvensis. Britain and Ireland.

17. S. apetala. Ditto.

18. Cerastium pumilum. *Curt.* Ditto.

19. C. semidecandrum. Ditto.

20. C. Riæi. *Gay.* Mountains.

21. Arenaria montana. South of France.

XXXIII. LINEÆ.

1. Linum Gallicum. South of France.

2. L. strictum. Ditto.

XXXIV. CISTINEÆ.

1. Helianthemum alyssoides. *Vent.* South of France.

2. Cistus hirsutus. *Lam.* South of Europe.

XXXV. MALVACEÆ.

1. Malva geraniifolia. *Gay.* Sp. nov.

XXXVI. GERANIACEÆ.

1. Erodium malachoides. South of Europe, Italy, Greece.

2. Geranium Pyrenaicum. Britain, but most probably introduced from the Continent.

XXXVII. HYPERICINEÆ.

1. Hypericum lineare. *Wahl.* South of Europe, but growing on the Spanish Alps.
2. H. fimbriatum. *Lam.*

XXXVIII. RANUNCULACEÆ.

1 Ranunculus hederaceus. Common.
2. Ditto, var. Ditto.
3. Aconitum Lycoctonum. Norway, Sweden, Switzerland.

SUMMARY OF SPECIES.

CRYPTOGAMIA.

1.	Fungi	3
2.	Algæ	43
3.	Lichenes	16
4.	Hepaticæ	21
5.	Musci	58
6.	Filices	21
		162

MONOCOTYLEDONES.

1.	Gramineæ	35
2.	Cyperaceæ	7
3.	Typhineæ	1
4.	Fluviales	4
5.	Junceæ	6
6.	Asphodeleæ	1
7.	Smilaceæ	1
8.	Alismaceæ	1
9.	Colchicaceæ	1
10.	Liliaceæ	4
11.	Irideæ	1
12.	Orchideæ	3
		65

DICOTYLEDONES.

1.	Coniferæ	1
2.	Amentaceæ	1
3.	Santalaceæ	1
4.	Eleagneæ	1
5.	Polygoneæ	2
6.	Chenopodeæ	4
7.	Paronychieæ	5
8.	Plantagineæ	1
9.	Plumbagineæ	1
10.	Scrophularineæ	14
11.	Labiatæ	3
12.	Lentibularieæ	4
13.	Boragineæ	3
14.	Gentianeæ	1
15.	Ericeæ	9
16.	Vaccinieæ	1
17.	Campanulaceæ	4
18.	Compositæ	24
19.	Valerianeæ	2
20.	Rubiaceæ	4
21.	Umbelliferæ	13
22.	Saxifrageæ	5
23.	Droseraceæ	1
24.	Crassulaceæ	3
25.	Salicarieæ	1
26.	Onagrarieæ	4
27.	Rosaceæ	2
28.	Leguminosæ	22
29.	Celastrineæ	1
30.	Fumariaceæ	2
31.	Cruciferæ	12
32.	Caryophylleæ	21
33.	Lineæ	2
34.	Cistineæ	2
35.	Malvaceæ	1
36.	Geraniaceæ	2
37.	Hypericineæ	2
38.	Ranunculaceæ	3
		185

Cryptogamia:		
Cellular	141	
Vascular	21	162
Monocotyledones		65
Dicotyledones		185
		412

Newcastle-upon-Tyne,
March 24th, 1837.

FLORÆ INSULARUM NOVÆ ZELANDIÆ PRECURSOR; OR A SPECIMEN OF THE BOTANY OF THE ISLANDS OF NEW ZEALAND.

By Allan Cunningham, Esq.

(Continued from page 233 of the present Volume.)

PLANTÆ CELLULARES.

ALGÆ.

I. FUCOIDEÆ.

1. Sargassum. *Rumph. Agardh. Grev.*

1. S. *vulgare*, fronde compressa, foliis lineari-lanceolatis serratis, vesiculis sphæricis muticis, receptaculis cylindricis racemosis. *Spr. Syst. Veg.* 4. *p.* 320. *Agard. Syst. Alg. p.* 293. *Grev. Syst. Alg. p.* 29. *Endl. Syn. Fl. Insul. Oc. Austr. in Ann. der Wien. Mus. band.* 1. *p.* 144.—Fucus natans. *Turn. Hist. Fucor. t.* 47. *Engl. Bot. t.* 2114.

New Zealand.—1769, *Sir Jos. Banks.*—1827, *A. Lesson* (Endl.).

2. S. *plumosum*, caudice simplicissimo basi nudo subbipedali complanato, fronde generali oblonga angusta apice obtusa in lacinias profunde pinnatifidas (lacinulis angusto-linearibus) aut in lacinias ramosissimas subdichotomas divisa, vesiculis ovoideis apice nudis, subpedicellatis. *A. Rich. Sert. Astrolab. p.* 136.—*α.* segmentis capillaribus subdichotomis. S. capillifolium. *A. Rich. Fl. Nov. Zel. p.* 16. *t.* 5.—*β.* segmentis pinnatifidis linearibus. S. pennigerum, *Ib. Fl. Nov. Zel. p.* 16. *t.* 6.

East coast of New Zealand. Howa Howa Bay. *D'Urville*, lat. 38° S.

3. S. *Atlanticum*, caule ramoso, foliis lineari-oblongis acutis margine dentato undulatis, vesiculis pisiformibus. *A. Rich. Fl. Nov. Zel. p.* 15. *Bory in Duperr. Voy. p.* 123.

Coasts of New Zealand. *D'Urville* and *Lesson.*

4. S. *granuliferum. Agardh. Syst. Alg. p.* 305. *Ic. Alg. t.* 11. *Spreng. Syst. Veget.* 4. *p.* 322. *Grev. Syn. Spec. Alg. p.* 31.

Shores of New Zealand. Cook's Strait. *D'Urville.*

5. S. *droserifolium* caule flexuoso virgato vage bipinnatifido, ramulis pinnato-pyramidatis, foliis ovato-cuneatis denticulato-spinosis, receptaculis compositis in petiolo adfixis, vesiculis ovatis stipitatis. *Bory in Duperr. Voy. p.* 129. *Grev. Syn. Spec. Alg. p.* 30.

Shores of New Zealand. *Lesson.*

6. S. *longifolium. Agardh. Syst. Alg. p.* 299. *Spreng. Syst. Veg.* 4. *p.* 321. *Grev. Syn. Spec. Alg. p.* 30. *A. Rich. Fl. Nov. Zel. (Sert. Astrolab.) p.* 139.—Fucus longifolius. *Turn. Hist. Fucor. t.* 104.

Shores of New Zealand. *Sir. J. Banks. D'Urville.*

7. S. *duplicatum. Bory in Duperr. Voy. p.* 127. *Grev. Syn. Sp. Alg. p.* 30.

Shores of New Zealand. *Lesson.*

8. S. *Lessonianum*, fronde basi stipitata nuda subpinnata apice bipartita, laciniis longissimis erecto-strictis basi angustatis superioribus margine exteriori semipinnatis arcuatis, segmentis linearibus obtusis grosse serratis, stipite plano brevi, vesiculis margine interiori adnatis. *A. Rich. Sert. Astrolab. p.* 137.—Marginaria Gigas, *ib. Pl. Nov. Zel. p.* 10. *t.* 4.

Shores of New Zealand. Kana-Kana Bay. *Lesson.*

9. S. *Urvillianum*, fronde stipitata basi nuda pinnata, laciniis basi angustatis patulis in segmentis 3—4 oblongis obtusis serratis divisis. *A. Rich. Sert. Astrolab. p.* 138.—Marginaria Urvilliana, *ib. Fl. Nov. Zel. p.* 10. *t.* 3.

Shores of New Zealand. Kana-Kana Bay. *Lesson.*

10. S. *Boryanum*, fronde cartaliginea stipitata basi nuda pinnato-flabellata laciniis numerosis angusto-linearibus planis 2—3 pedalibus distanter et alternatim divisis uncinato-serratis, vesiculis ovoideo-oblongis pedicellatis apice acutis aut obtusis marginalibus, receptaculis numerosissimis linearibus apice basique acutis pollicem longis uti vesiculis marginalibus et externam tantùm frondis marginem occupantibus. *A. Rich. Sert. Astrolab. p.* 138.

Shores of New Zealand. *D'Urville.*

2. Turbinaria. *Lamouroux, Bory.*

Frons foliosa. *Folia* petiolata, peltata, triangulata, in vesiculam inflata. *Receptacula* minuta, ramosa, cylindrica, tuberculata, axillaria.

11. T. *denudata*, foliis vesiculatis subpeltatis longe stipitatis margine repando dentato-spinescente coronata, petiolis nudis. *Bory, in Duperr. Voy. p.* 107. *A. Rich. Fl. Nov. Zel. p.* 18. *Grev. Syn. Spec. Alg. p.* 32.—Sargassum turbinatum. *Agard. Syst. Alg. p.* 308. *Spreng. Syst. Veget.* 4. *p.* 324.—Fucus turbinatus. *Turn. Hist. Fucor. t.* 24. *f. a.—e.*

Shores of New Zealand. *Sir Joseph Banks. Lesson.*

3. Carpophyllum. *Grev.*

Frons plana vel compresso-plana. *Folia*

ramiformia disticha. *Receptacula* minuta, tuberculata, cylindracea, in racemis marginalibus.

12. C. *flexuosum. Grev. Syn. Spec. Alg. p.* 32. — Sargassum phyllanthum. *Agard. Syst. Alg. p.* 309. *Spreng. Syst. Veg.* 4. *p.* 325.—Fucus phyllanthus. *Turn. Hist. Fucor. t.* 206.

Coasts of New Zealand.—1769, *Sir Joseph Banks*.—1827, *D'Urville*.

13. C. *maschalocarpum. Grev. Syn. Spec. Alg. p.* 32.—Sargassum maschalocarpum. *Agard. Syst. Alg. p.* 309. *Spr. Syst. Veg.* 4. *p.* 315.—Fucus maschalocarpus. *Turn. Hist. Fucor. t.* 205.

Shores of New Zealand.—1769, *Sir Joseph Banks*.

4. Cystoseira. *Agardh. Greville.*

Frons ramosa. *Folia* ramiformia, superne filiformia. *Vesiculæ* simplices vel subconcatenatæ in foliis innatis vel petiolatæ. *Receptacula* tuberculata, loculosa, capsulis filis intermixtis.

14. C. *retroflexa. Agard. Syst. Alg. p.* 289. *Spreng. Syst. Veg.* 4. *p.* 318. *A. Rich. Fl. Nov. Zel. p.* 12. *Grev. Syn. Alg. p.* 33.—Fucus retroflexus. *Labill. Nov. Holl.* 2. *p.* 113. *t.* 290.

East coast of New Zealand. Kouraki-Bay, River Thames. *D'Urville*.

15. C. *torulosa. Agard. Syst. Alg. p.* 290. *Spreng. Syst. Veg.* 4. *p.* 319. *Grev. Syn. Sp. Alg. p.* 33. *A. Rich. Sert. Astrolab. p.* 139.—Fucus torulosus. *Turn. Hist. Fucor. t.* 157.

Coast of New Zealand. *D'Urville*.

16. C.? *quercifolia. Agard. Syst. Alg. p.* 289. *Spreng. Syst. Veget.* 4. *p.* 318. *Grev. Syn. Spec. Alg. p.* 33. *A. Rich. Sert. Astrolab. p.* 139.—Fucus quercifolius. *Turn. Hist. Fucor. t.* 151.

Coast of New Zealand. *D'Urville*.

5. Castralia. *A. Richard.*

Receptacula peltata minima, apice multifido-ramosa tuberculorum instar, folia vesiculasque obtegentia. *Caulis* gracilis, ramosus, teres, plenus: *folia* minuta, ovalia, sessilia, subpeltata, imbricata, vesiculis pisiformibus uti folia receptaculis sporulorum obtectis.

17. C. *salicornioides. A. Rich. Sert. Astrolab. p.* 143.

Shores of New Zealand. *Lesson*.

6. Moniliformia. *Lamour. Bory. Greville.*

Frons filiformis, ramosa. *Receptacula* tuberculata, nonloculosa, rotundata per frondis totam longitudinem distincte moniliformia. Folia vesiculæque nulla.

18. M. *Billardieri. Bory, in Duperr. Voy. p.* 133. *Grev. Syn. Sp. Alg. p.* 36.—Monilia Billardieri. *A. Rich. Fl. Nov. Zel. p.* 19.—Fucus moniliformis. *Lab. Nov. Holl.* 2. *p.* 114. *t.* 262.

East coast of New Zealand. Wangari Bay, River Thames.—1827, *D'Urville*.

19. M. *Sieberi. Bory, in Duperr. Voy. p.* 134. *Rich. Sert. Astrolab. p.* 139.—Cystoseira Sieberi. *Endl. Syn. Fl. Insul. Oc. Aust. in Ann. der Wien. Mus. band.* 1. *p.* 144.

Coast of New Zealand. *Lesson* (Endl.)

7. Splachnidium. *Grev.*

Frons cylindracea, tubularis, subinflata, coriacea. *Tubercula* per totam frondem sparsa, pertusa.

20. S. *rugosum. Grev. Syn. Alg. p.* 36. *Endl. Syn. Fl. Insul. Oc. Austr. in Ann. der Wein. Mus. band.* 1. *p.* 144.—Fucus rugosus. *Agardh. Syst. Alg. p.* 280. *Turn. Hist. Fucor. t.* 185.

Coast of New Zealand.—1827, *Lesson* (Endl.)

II. Laminarieæ.

8. Durvillea. *Bory. Grev.*

Frons plana, coriacea, in segmentis elongatis subulatis cylindraceis fissa. *Fructus:* glomeruli seminum sparsi immersi.

21. D. *utilis. Bory, in Duperr. Voy. p.* 65. *t.* 1 *and* 2. *A. Rich. Fl. Nov. Zel. p.* 8. *Grev. Syn. Sp. Alg. p.* 37.

East coast of New Zealand. Kana-Kana Bay. *D'Urville* and *Lesson*.

9. Macrocystis. *Agardh. Grev.*

Frons coriacea, foliosa, ramosa. *Folia* plana, elongata, enervia, petiolata, vesiculo solitario ab basin instructa.

22. M. *pyrifera. Agard. Syst. Alg. p.* 292. *Grev. Syn. Sp. Alg. p.* 37. *Spreng. Syst. Veg.* 4. *p.* 320.—M. communis. *Bory in Duperr Voy. p.* 90. *A. Rich. Fl. Nov. Zel. p.* 13.—Fucus pyriferus. *Turn. Hist. Fucor.* 2. *t.* 110.

East coast of New Zealand. Kana-Kana Bay. *Lesson*.

23. M. *angustifrons*, caule subsimplici frondibus linearibus longissimis grosse et distanter argute serratis submembranaceis basi in vesiculam pyriformem sensim desinentibus. *A. Rich. Fl. Nov. Zel. p.* 13.—Macrocystis angustifrons. *Bory, in Duperr. Voy. p.* 93. *t.* 8. *Grev. Syn. Alg. p.* 38.

East coast of New Zealand. Bay of Islands. *Lesson*.

24. M.? *comosa*. *Agard. Syst. Alg.* p. 292. *Spreng. Syst. Veget.* 4. *p.* 320. *Grev. Syn. Sp. Alg. p.* 38. *A. Rich. Fl. Nov. Zel. p.* 14.—Fucus comosus. *Labill. Nov. Holl.* 2. *p.* 112. *t.* 258.

Coasts of New Zealand. *D'Urville.*

Obs. Species memorabilis, vix ad *Macrocystem* sed ad *Fucum* vel proprium genus pertinet. *Grev.*

Shores of New Zealand. *D'Urville.*

10. Laminaria. *Lamour. Grev.*

Frons stipitata, coriacea, plano-expansa enervis. *Fructus:* semina in soris aggregata et fronde immersa.

25. L. *flabelliformis;* longe stipitata, stipite complanato, fronde maxima subblondea coriaceo-membranacea, flabellato-pinnata undulata, pinnulis bi-trifidis oblongis obtusis late et irregulariter serratis venoso-bullatis. *A. Rich. Fl. Nov. Zel. p.* 8. *tab.* 1 *et* 2.

East coast of New Zealand. Wangari Bay, River Thames. *D'Urville.*

26. L. *biruncinata*. *Bory, in Duperr. Voy. p.* 101. *t.* 10. *Grev. Syn. Sp. Alg. p.* 38. *A. Rich. Sert. Astrolab. p.* 140.

Coast of New Zealand. *D'Urville.*

27. L. *radiata*. *Agard. Syst. Alg. p.* 271. *Grev. Syn. Alg. p.* 38. *Spreng. Syst. Veg.* 4. *p.* 326. *A. Rich. Sert. Astrolab. p.* 140.—Fucus radiatus. *Turn. Hist. Fucor. t.* 134.

Coast of New Zealand. *D'Urville.*

28. L. *pygmæa*, fronde plana subcoriacea 1—2 unciali profunde pinnatifida laciniis oblongo-linearibus obtusis integris basi angustatis, receptaculis frondi immersis distinctis oblongo-punctiformibus rima externe dehiscentibus. *A. Rich. Sert. Astrolab. p.* 139.

Coasts of New Zealand.—1827, *Lesson.*

III. Florideæ.

11. Amansia. *Lamour. Grev.*

Frons plana vel compressa, membranacea, obscure costata transversim striata, ad apicem sæpe involuta. *Fructus:* 1. capsulæ; 2. granula ternata.

29. A. *multifida*. *Lamour. Essai. p.* 55. *Agard. Syst. Alg. p.* 247. *A. Rich. Fl. Nov. Zel. p.* 7. *Grev. Syn. Sp. Alg. p.* 46. *Spreng. Syst. Veg.* 4. *p.* 332.—Fucus lineatus. *Turn. Hist. Fucor. t.* 33.

Shores of New Zealand.—1769, *Sir J. Banks.*

Obs. Species forsan dubia, sed fronde certe transversim striata. *Grev. loc. cit.*

12. Rhodomenia. *Grev.*

Frons plana, membranacea, roseo-rubra, omniño avenia, sessilis vel breviter stipitata. *Fructus:* 1. capsulæ hemisphæricæ, sparsæ; 2. granula ternata minutissima in soris indefinitis.

31. R. *corallina*. *Grev. Syn. Alg. p.* 43.—Sphærococcus corallinus. *A. Rich. Fl. Nov. Zel. p.* 3. *Bory, in Duperr. Voy. p.* 175. *t.* 16.

Coast of New Zealand. *Lesson.*

32. R. *Chauvinii*. *Grev. Syn. Alg. p.* 49.—Sphærococcus laciniatus. *A. Rich. Fl. Nov. Zel. p.* 4.—S. Chauvinii. *Bory, in Duperr. Voy. p.* 165. *t.* 20.

Coast of New Zealand. *D'Urville.*

33. R.? *lusoria;* fronde stipitata cartilaginea simplici (?) sæpissime fissa, segmentis deinde dilatatis contractisve valde proliferis vage inordinateque prælongis. *Grev. MSS.*

East coast of New Zealand.—1834, *Richard Cunningham.*

13. Thamnophora. *Agardh. Grev.*

Frons plana, avenia, pinnatifida. *Radix* repens reticulato-fibrosa. *Fructus;* receptacula filiformia ramulosa, in pulvinulis coacervatis et granula includentia.

34. T. *corallorhiza*. *Agard. Syst. Alg. p.* 240. *Spreng. Syst. Veg.* 4. *p.* 334. *Grev. Syn. Alg. p.* 49. *A. Rich. Fl. Nov. Zel. p.* 7.—Fucus corallorhiza. *Turn. Hist. Fucor. t.* 96.—F. cirrhosus, *ib. t.* 63.

Middle Island, New Zealand. Dusky Bay.—1773, *G. Forster.*

35. T. *Cunninghamii;* fronde tenerrima angusta ramosissima, ramis elongatis decompositis late patentibus, ramulis alternis subulatis exterius ciliato-dentatis. *Grev. MSS.*

East coast of Northern Island.—1834, *Richard Cunningham.*

14. Plocamium. *Lamour. Grev.*

Frons filiformis compressa, subcartilaginea, coccinea, ramosissima, ramis distichis. *Fructus:* 1. capsulæ sphæricæ; 2. granula oblonga transversim multipartita, in receptaculis linearibus foliaceis.

36. P. *coccineum*. *Lyngb. Hydrop. Dan. p.* 39. *t.* 9. *Grev. Brit. Alg. p.* 98. *t.* 12; *ib. Syn. Alg. p.* 50.—Wormskioldia Plocamium. *Spreng Syst. Veg.* 4. *p.* 33.—Fucus coccineus. *Turn. Hist. Fuc. t.* 59. *Engl. Bot. t.* 1242.

East coast of New Zealand.—1834, *R. Cunningham* (Grev.)

37. P. *confervaceum*, caule ramoso lineari-plano, ramulis numerosissimis brevibus tenuissimis irregulariter multisectis. *A. Rich. Fl. Nov. Zel. p.* 3. *Duperr. Voy. p.* 164. *Grev. Syn. Alg. p.* 50.

Coast of New Zealand. *Lesson.*
OBS. Species dubia. *Grev. loc. cit.*

15. RHODOMELA. *Agard. Grev.*

Frons filiformis, cylindracea vel compressa, ramosissima coriaceo-cartilaginea (ad apicem sæpe involuta). *Fructus* 1. capsulæ, semina pyriformi includentes; 2. granula ternata in receptaculis filiformibus.

38. R. *pinastroides. Agard. Syst. Alg. p.* 200. *A. Rich. Fl. Nov. Zel. p.* 1. *Grev. Brit. Alg. p.* 104. *t.* 13. *Spreng. Syst. Veget.* 4. *p.* 343. — Fucus pinastroides. *Turn. Hist. Fuc. t.* 11. *Engl. Bot. t.* 1042.

Coast of New Zealand.—1769, *Sir. Joseph Banks.*

16. LAURENCIA. *Lamour. Grev.*

Frons cylindracea, filiformis, gelatinoso-cartilaginea. *Fructus:* 1. capsulæ ovatæ, apice pertusæ, semina pyriformia pedicellata includentes; 2. granula ternata in ramulis immersa.

39. L. *obtusa. Lamour. Essai. p.* 42. *Grev. Syn. Alg. p.* 52. *id. Brit. Alg. p.* 3. —Chondria obtusa. *Agard. Syst. Alg. p.* 202. *Spreng. Syst. Veget.* 4. *p.* 341.—Fucus obtusus. *Turn. Hist. Fuc. t.* 21. *Engl. Bot. t.* 1201.

Coast of New Zealand.—1769, *Sir Joseph Banks.*

40. L. *Forsteri. Grev. Syn. Alg. p.* 52.—Chondria Forsteri. *Agard. Syst. Alg. p.* 303. *A. Rich. Fl. Nov. Zel. p.* 2. *Spr. Syst. Veg.* 4. *p.* 341.—Fucus Forsteri. *Turn. Hist. Fucor. t.* 77.

Coast of New Zealand.—1773, *G. Forster.*

41. L. *papillosa. Grev. Syn. Alg. p.* 52.—Chondria papillosa. *Agard. Syst. Alg. p.* 203. *A. Rich. Fl. Nov. Zel. p.* 2. *Spr. Syst. Veg.* 4. *p.* 341.—Fucus thyrsoideus. *Turn. Hist. Fucor. t.* 19.

Coast of New Zealand.—1769, *Sir Joseph Banks.*

17. CHONDRUS. *Stackh. Lamour. Grev.*

Frons cartilaginea, plana, enervia, dichotoma, sursum dilatata, livido-rubra. *Fructus:* capsulæ sparsæ plerumque in disco frondis immersæ rarius pedicellatæ. *Semina* minuta, rotundata.

42. C.? *alveatus. Grev. Syn. Alg. p.* 55.—Sphærococcus alveatus. *Agard. Syst. Alg. p.* 223. *A. Rich. Fl. Nov. Zel. p.* 5. *Spreng. Syst. Veget.* 4. *p.* 337.—Fucus alveatus. *Turn. Hist. Fucor. t.* 239.

Coasts of New Zealand.—1769, *Sir Joseph Banks.* Bay of Islands.—1834, *Richard Cunningham.*

43. C. *abscissus. Grev. Syn. Alg. p.* 55.—Sphærococcus abscissus. *Agard. Syst. Alg. p.* 217. *A. Rich. Fl. Nov. Zel. p.* 6.—Fucus abscissus. *Turn. Hist. Fucor. t.* 223.

Shores of New Zealand.—1769, *Sir Joseph Banks.*

44. C. *chondrophyllus. Grev. Syn. Alg. p.* 55.—Sphærococcus chondrophyllus. *Agard. Syst. Alg. p.* 217. *Spreng. Syst. Veg.* 4. *p.* 336. *A. Rich. Fl. Nov. Zel. p.* 5.—Fucus chondrophyllus. *Turn. Hist. Fucor. t.* 222.

East coast of New Zealand. Wangari-Bay.—1827, *D'Urville.*

18. GELIDIUM. *Lamour. Grev.*

Frons cartilaginea, cornea, compressa, linearis, plus minusve pinnata. *Fructus:* 1. *capsulæ* in ramulis immersæ *semina* nuda rotundata includentes; 2. granula composita in ramulis nidulantia.

45. G. *corneum. Lamour. Essai. p.* 41. *Grev. Syn. Alg. p.* 57. *ib. Brit. Alg. p.* 141. *t.* 15. — Sphærococcus corneus. *Agard. Syst. Alg. p.* 225. *Spreng. Syst. Veg.* 4. *p.* 337.—Fucus corneus. *Turn. Hist. Fuc. t.* 57. *Engl. Bot. t.* 1970.

East coast of New Zealand. Shore, North from the Bay of Islands.—1834, *R. Cunningham.*

OBS. A variety, remarkable for its luxuriant ramification. *Grev. in litt.*

19. HYPNEA. *Lamour. Grev.*

Frons cartilaginea, cylindrica, filiformis, ramosissima ad apicem ramulorum sæpe incurva. *Fructus* obscurus, granula in ramulis setaceis intumescentibus siliquæformibus nidulantia.

46. H. *musciformis. Lamour. Essai, p.* 43. *Grev. Syn. Alg. p.* 59.—Sphærococcus musciformis. *Agard. Syst. Alg. p.* 238. *Spreng. Syst. Veget.* 4. *p.* 340. *A. Rich. Fl. Nov. Zel. p.* 6.—Fucus musciformis. *Turn. Hist. Fucor. t.* 127.

Shores of New Zealand.—1769, *Sir J. Banks.*

20. HALYMENIA. *Agardh. Grev.*

Frons subplana vel cylindrica, gelatinoso-membranacea, roseo-rubra, plus minusve dichotoma, segmentis sæpe laciniatis. *Fructus:* glomeruli punctiformes seminum substantia interiori frondis immersi.

47. H. *furcellata. Agard. Syst. Alg. p.* 244. *Spreng. Syst. Veg.* 4. *p.* 333. *Grev. Syn. Alg. p.* 62. *id. Brit. Alg. p.* 163.—Ulva furcellata. *Engl. Bot. t.* 1881.

East coast of New Zealand.—1834, *R. Cunningham* (Grev.)

48. H. *dubia*. *Bory, in Belang. n.* 32. *A. Rich. Sert. Astrolab. p.* 141. *Endl. Syn. Fl. Ins. Oc. Austr. in Ann. der Wien. Mus. band.* 1. *p.* 144.

Coasts of New Zealand.—1827, *D'Urville.*

LICHENES.

1. Parmelia. *Ach.*

49. P. *aurea* (non Spreng. 4. 298), thallo crustaceo suborbiculari albido maculis latis irregularibus sparsis subelevatis notato glabro irregulariter inciso, lobis bullatis divisis superpositis obtusis subtus concolori glabro, apotheciis subsessilibus centro affixis luteis planis margine integro vix prominulo. *A. Rich. Fl. Nov. Zel. p.* 23. *t.* 8. *f.* 1.

New Zealand. On trees and rocks in Astrolabe Harbour, on the North coast of the Middle Island.—1827, *D'Urville.*

Obs. Cette espèce est nouvelle, mais elle nous parait voisine du *P. rutilans, Achar.* (*A. Rich. loc. cit.*)

50. P. *pulverulenta*. *Ach. Lich. p.* 473. *Spreng. Syst. Veg.* 4. *p.* 283. *A. Rich. Fl. Nov. Zel. p.* 23. *Engl. Bot. t.* 2663.

New Zealand. Cook's Strait.—1827, *D'Urville.*

51. P. *linearis*. *Ach.—Spreng. Syst. Veg.* 4. *p.* 278.

New Zealand, 1769. *Sir Joseph Banks.*

52. P. *perlata*. *Ach. Syn. p.* 197. *Spreng. Syst. Veg.* 4. *p.* 288. *Endl. Prod. Fl. Norf. p.* 1. *A. Rich. Fl. Nov. Zel. p.* 24. *Engl. Bot. t.* 341.

New Zealand. Astrolabe Harbour.—1827, *D'Urville.*

2. Cetraria. *Achar.*

53. C. *glauca*. *Ach. Syn. p.* 227. *A. Rich. Fl. Nov. Zel. p.* 25. *Engl. Bot. t.* 1606.—Parmelia glauca. *Spreng. Syst. Veget.* 4. *p.* 283.

New Zealand. On rocks and trees, gathered at Astrolabe Harbour.—1827, *D'Urville.*

3. Sticta. *Ach.*

54. S. *aurata*. *Ach. Lich. p.* 448. *Spreng. Syst. Veg.* 4. *p.* 302. *Endl. Prod. Fl. Norf. p.* 1. *A. Rich. Fl. Nov. Zel. p.* 25.—Lichen auratus. *Engl. Bot. t.* 2359.

New Zealand. On rocks and trees at Astrolabe Harbour.—1827, *D'Urville.*

55. S. *Mougeotiana*; thallo cartilagineo laciniato lævi lobis elongatis multifidis lobulis rotundato-crenatis marginibus erosis flexuosis inflexis supra glauco-hepatico, pulvinulis fruticulosis auratis immarginatis tecto, subtus rugoso vix tomentoso ad centrum nigricante in ambitu brunneo-pallido, cyphellis minutis citrinis, apotheciis —*A. Rich. Fl. Nov. Zel. p.* 26. *Delise Monogr. p.* 62. *t.* 5. *f.* 13.

56. S. *latifrons*, thallo cartilagineo subdendriformi e stipite brevi crasso sublacunoso centrali circumeffuso profunde lobato lobis dilatatis obtusis varie et obtuse incisis supra glabris luteo-griseis subtus tomentosis subfusco-luteis, cyphellis orbiculatis concavis concoloribus glabris, apotheciis in facie superiori numerosissimis brunneis orbiculatis obsolete marginatis. *A. Rich. Fl. Nov. Zel. p.* 27. *t.* 8. *f.* 2.

New Zealand. Astrolabe Harbour.—1827, *D'Urville.*

57. S. *cinnamomea*, thallo cartilagineo expanso irregulariter diffuso et profunde lobato, lobis dilatatis apice marginibusque incisis lobulis integris aut emarginatis subimbricatis supra glaberrimo lucenti brunneo-flavescenti subcinnamomeo subtus præsertim ad basin divisionum obscuriori tomentello cyphellis albis minimis consperso, apotheciis paucioribus submarginalibus planiusculis nigrescentibus marginatis, margine crenulato discolori. *A. Rich. Fl. Nov. Zel. p.* 28. *t.* 8. *f.* 3.

New Zealand, with the preceding. *D'Urville.*

58. S. *variabilis*, thallo cartilagineo prostrato laciniato lobis crenulatis apicibus tenuiter dissectis supra lævi pallido ochraceo in humido virescente subtus tomentoso ad centrum fusco-nigrescenti in ambitu ochroleuco, cyphellis urceolatis pallidis, apotheciis submarginalibus disco fusco-rubro margine prominulo. *A. Rich. Fl. Nov. Zel. p.* 29. *Delise Monogr. p.* 119. *t.* 11. *f.* 48.

New Zealand, with the preceding. *D'Urville.*

59. S. *filicina*. *Ach. Syn. p.* 230. *Spreng. Syst. Veg.* 4. *p.* 303. *A. Rich. Fl. Nov. Zel. p.* 29. *Delise Monogr. p.* 120. *t.* 12. *f.* 49.

New Zealand.—1773, *G. Forster.*

60. S. *carpoloma*, thallo cartilagineo coriaceo lobis laciniatis angustis elongatis subcorniculatis truncato-emarginatis, supra lacunosis glabris griseo-flavescentibus subtus tomentoso-ochroleucis, cyphellis albis apotheciis marginalibus disco nigrescente subglauco planiusculo margine discolori subintegro. *A. Rich. Fl. Nov. Zel. p.* 30. *t.* 9. *f.* 1. *Delise Monogr. p.* 159.

New Zealand, Middle Island. Astrolabe Harbour. Tasman's Bay.—1827, *D'Urville.*

4. Nephroma. *Achar.*

61. N. *Australe*, thallo subcartilagineo supra glabro obscure luteo in ambitu sub-

fusco profunde et irregulariter diviso lobis fertilibus obtusis basi angustatis resupinatis subtus pallidiori glabro albicante, apotheciis suborbiculatis planis castaneo-glaucis margine thallo exili circumscriptis. *A. Rich. Fl. Nov. Zel. p.* 31. *t.* 9. *f.* 2.

New Zealand. Astrolabe Harbour.—1827, *D'Urville.*

5. Cenomyce. *Achar.*

62. C. *retipora. Ach. Syn. p.* 248. *A. Rich. Fl. Nov. Zel. p.* 32.—Cladonca retipora. *Spreng. Syst. Veg.* 4. *p.* 270.—Bæomyces retiporus. *Labill. Nov. Holl.* 2. *p.* 110. *t.* 254. *f.* 2.

New Zealand. On rocks and in shaded grounds, Astrolabe Bay.—1827, *D'Urville.*

63. C. *furcata. Ach. Syn. p.* 276. *A. Rich. Fl. Nov. Zel. p.* 32.—Cladonia furcata. *Hoffm.—Spreng. Syst. Veget.* 4. *p.* 270.

New Zealand. Shaded woods, on the soil. Astrolabe Harbour.—1827, *D'Urville.*

64. C. *rangiferina. Ach. Syn. p.* 277. *A. Rich. Fl. Nov. Zel. p.* 33. *Engl. Bot. t.* 173.—Cladonia rangiferina. *Hoffm.—Spreng. Syst. Veg.* 4. *p.* 270.

New Zealand. Woods at Astrolabe Harbour.—1827, *D'Urville.*

65. C. *ecmocyna. Ach. Syn. p.* 261. *A. Rich. Fl. Nov. Zel. p.* 33.—Cladonia gracilis. *Spreng. Syst. Veget.* 4. *p.* 273.

New Zealand. Shaded woods at Astrolabe Harbour.—1827, *D'Urville.*

6. Stereocaulon. *Schreb. Achar.*

66. S. *ramulosum. Ach. Syn. p.* 284. *Spreng. Syst. Veget.* 4. *p.* 275. *A. Rich. Fl. Nov. Zel. p.* 34. *t.* 9. *f.* 3.

New Zealand, North Island. East coast in woods at the River Thames.—1827, *D'Urville.*

67. S. *macrocarpum*, thallo albo-lutescente a basi ramoso, ramis erectis elongatis subramosis granulatis, apotheciis terminalibus lateralibusque globoso-depressis lobulatis fusco-nigris. *A. Rich. Fl. Nov. Zel. p.* 34. *t.* 9. *f.* 4.

New Zealand. Middle Island. Woods at Astrolabe Harbour.—1827, *D'Urville.*

7. Alectoria. *Achar.*

68. A. *crinalis*; thallo subcompresso ramosissimo cinerascente aut lutescente fragili, ramis filiformibus superne teretiusculis lævibus glabris, apotheciis convexis fuscis. *Ach. Syn. p.* 292. *A. Rich. Fl. Nov. Zel. p.* 35.

New Zealand. Hanging from the trunk and branches of the *Kauri* (*Dammara australis, Lamb.*) and others of the larger timbers of the forests, intermixed frequently with *Usnea.*—1769, *Sir Joseph Banks.*—1826, *Allan Cunningham.*

8. Ramalina. *Achar.*

69. R. *farinacea. Ach. Syn. p.* 208. *A. Rich. Fl. Nov. Zel. p.* 35.—Physcia farinacea. *Pers. in Freyc. Voy. p.* 208.—Parmelia farinacea. *Spreng. Syst. Veget.* 4. *p.* 279. *Engl. Bot. t.* 889. (Lichen).

New Zealand. On rocks and trees at Astrolabe Harbour.—1827, *D'Urville.*

9. Cornicularia. *Achar.*

70. C. *aculeata. Ach. Syn. p.* 299. *A. Rich. Fl. Nov. Zel. p.* 36.—Parmelia Islandica? *Spreng. Syst. Veget.* 4. *p.* 280.

New Zealand, Middle Island. Astrolabe Bay.—1827, *D'Urville.*

10. Usnea. *Achar.*

71. U. *Cornicularia. Ach. Syn p.* 304. *A. Rich. Fl. Nov. Zel. p.* 36.—Parmelia Cornicularia. *Spreng. Syst. Veget.* 4. *p.* 277.

New Zealand. Astrolabe Harbour. *D'Urville.* On the trunks of trees.—1773, *G. Forster.*

72. U. *ceratina. Ach. Syn. p.* 304. *A. Rich. Fl. Nov. Zel. p.* 36.—Parmelia ceratina. *Spreng. Syst. Veget.* 4. *p.* 276.

New Zealand. In woods on the shores of Astrolabe Harbour.—1827, *D'Urville.*

73. U. *florida. Ach. Syn. p.* 304. *A. Rich. Fl. Nov. Zel. p.* 37.—Parmelia florida. *Spreng. Syst. Veget.* 4. *p.* 276.—Lichen floridus. *Engl. Bot. t.* 872.

Upon the trunks of aged trees in New Zealand, especially on the *Kauri Pine.* Bay of Islands, Wangaroa, &c.—1826, *Allan Cunningham.*—1827, *D'Urville.*

11. Collema. *Achar.*

74. C. *nigrescens, L.—Ach. Syn. p.* 321. *A. Rich. Fl. Nov. Zel. p.* 37.—Parmelia nigrescens. *Spreng. Syst. Veget.* 4. *p.* 287.—Lichen nigrescens. *Engl. Bot. t.* 345.

New Zealand. Middle Island. On trees and rocks in Astrolabe Harbour.—1827, *D'Urville.*

75. C. *tremelloides. Ach. Syn. p.* 326. *A. Rich. Fl. Nov. Zel. p.* 38—Parmelia tremelloides. *Spreng. Syst. Veg.* 4. *p.* 288.—Lichen tremelloides. *Engl. Bot. t.* 1981.

New Zealand. Upon rocks among moss at Astrolabe Bay. *D'Urville.* Bay of Islands.—1826, *Allan Cunningham.*

12. CÆNOGONIUM. *Ehrenb. in Nees ab Esenb. Horæ Physicæ Berol. p.* 120. *t.* 27.

76. C. *Linkii. Ehrenb. loc. cit. A. Rich. Fl. Nov. Zel. t.* 38.

New Zealand. Astrolabe Harbour. Tasman's Bay. N. W. coast of the Middle Island.—1827, *D'Urville.*

OBS. " Ce singulier Cryptogame, rapporté par les uns à la famille des Algues, par d'autres à celle des Champignons, mais plus généralement aux Lichens, a déjà été observé au Brésil, aux Iles Marianes, par notre excellent ami M. Gaudichaud, et enfin le Voyage du Capitaine d'Urville vient d'en constater l'existence à la Nouvelle Zélande. Les échantillons recueillis dans cette dernière localité etaient sans fructifications." *A. Rich. loc. cit.*

MUSCI CALYPTRATI.

1. SPHAGNUM. *L.*

77. S. *latifolium. Hedw.—Spreng. Syst. Veget.* 4. *p.* 147.—S. obtusifolium. *Engl. Bot. t.* 1405.

New Zealand. East coast; on rocks at the Great Fall of the Keri-Keri River.—1834, *Richard Cunningham.*

2. GYMNOSTOMUM. *Hedw.*

Seta terminalis. *Capsula* ore nudo. *Calyptra* dimidiata.

78. G. *gracile,* caule cæspitoso subramoso, foliis ovato-lanceolatis integerrimis nervosis longe piliferis, capsula oblongo-cylindracea pendula, operculo hemisphærico mutico. *Hook. Musc. Exot. t.* 22. *A. Rich. Fl. Nov Zel. p.* 48.—Leptostomum gracile. *Brown, in Linn. Trans.* 10. *p.* 321. *Spreng. Syst. Veget.* 4. *p.* 148.

New Zealand. Dusky Bay. Middle Island (lat. 45° South).—1791, *A. Menzies.* Northern Island —1834, *R. Cunningham.*

79. G. *macrocarpon,* caule simpliciusculo, foliis imbricatis erectis ovato-oblongis margine revolutis acutis apice pilo ramoso terminatis, nervo excurrente capsula ovali erecta. Leptostomum macrocarpon. *Brid.—Spreng. Syst. Veg.* 4. *p.* 148.—Bryum macrocarpum. *Hedw. Musc. Frond.* 3. *t.* 10.

New Zealand, on the East coast. Upon moist rocks.—1834, *R. Cunningham.*

80. G. *Leptostomum;* caule cespitoso subsimplici, foliis oblongis obtusiusculis integerrimis nervosis pilo simplici terminatis, capsula ovata erecta. *Hook. Musc. Exot. t.* 169. *A. Rich. Fl. Nov. Zel. p.* 48. —Leptostomum erectum. *Br. in Linn. Trans.* 10. *p.* 328. *Spreng. Syst. Veget.* 4. *p.* 148.

New Zealand. Astrolabe Harbour.—1827, *D'Urville.*

3. POLYTRICHUM. *L.*

81. P. *subulatum;* caule simplici, foliis lanceolatis serratis disco plicatis, capsulæ cylindraceæ operculo conico elongato. *Spreng. Syst. Veg.* 4. *p.* 176. *Menz. in Linn. Tr.* 4. *p.* 303.—Pogonatum subulatum. *Brid. Bryol.* 2. *p.* 122. *Endl. Syn. Fl. Ins. Occ. Austr. in Ann. der Wien. Mus. band.* 1. *p.* 148.

New Zealand. Middle Island. Dusky Bay.—1791, *A. Menzies.*

82. P. *dendroides,* caule longissimo, ramis fastigiatis, foliis oblongo-linearibus serratis, nervo crasso, seta terminali. *Spr. Syst. Veg.* 4. 176.—Pogonatum dendroides. *Brid. Bryol.* 2. *p.* 112. *Endl. Syn. etc.* 1. *p.* 148.

New Zealand. Middle Island. Dusky Bay.—1791, *A. Menzies.*

83. P. *tenuirostre;* caule brevi simplici, foliis patentibus lanceolatis obtusis subflexuosis canaliculatis integerrimis, nervo subangusto lanceolato, capsula ovata, operculo longo subulato. *Hook. Musc. Exot. t.* 75. *Spreng. Syst. Veg.* 4. *p.* 176. *A. Rich. Fl. Nov. Zel. p.* 49.

New Zealand. Middle Island. Dusky Bay.—1791, *A. Menzies.* Northern Isle. —1834, *R. Cunningham.*

4. DICRANUM. *Hedw.*

Seta terminalis. *Peristomium* simplex, e dentibus 16, bifidis. *Calyptra* dimidiata. (*Hooker*).

84. D. *glaucum,* trunco erecto ramoso, foliis dense imbricatis ovato-lanceolatis exfasciculatis, sporangii inclinati oblongo-ovati operculo curvirostro acutissimo. *Brid. Musc.* 2. *p.* 165. *A. Rich. Fl. Nov. Zel. p.* 50. *Spreng. Syst. Veg.* 4. *p.* 165.

New Zealand.—1827, *D'Urville.* East coast.—1834, *R. Cunningham.*

85. D. *Billardieri;* caule erecto diviso, foliis e basi vaginante lineari-subulatis falcato-secundis denticulatis, thecæ cernuæ subcylindricæ basi strumiferæ operculo conico-rostrato incurvo longissimo. *Brid. Musc.* 1. *p.* 227. *Schwaegr. Suppl.* 2. *p.* 70. *t.* 121. *A. Rich. Fl. Nov. Zel. p.* 49. *Spreng. Syst. Veg.* 4. *p.* 168.

New Zealand.—1827, *D'Urville.*

86. D. *dicarpon. Spreng. Syst. Pl. secund. Grev.—Schwaegr. Sp. Musc. t.* 251.

New Zealand, on the East coast. Bay of Islands.—1834, *R. Cunningham.*

5. TRICHOSTOMUM. *Hedw.*

Seta terminalis. *Peristomium* e dentibus 16 ad basin divisis, vel 32 per paria approximatis. *Calyptra* mitriformis.

87. T. *perichætiale*, caule erecto ramoso, foliis lanceolatis tenuiter acuminatis perichætialibus longe vaginatis, seta elongata, capsula oblonga, operculo subulato. *Hook. Musc. Exot. t.* 73. *Spreng. Syst. Veget.* 4. *p.* 171. *A. Rich. Fl. Nov. Zel. p.* 50.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies.*

6. LEUCODON. *Schwaegr.*

Seta lateralis. *Peristomium* simplex, e dentibus 16 fissis, vel 32 per paria arcte unitis.

88. L. *calycinus*, caule repente, ramis erectis subsimplicibus, foliis ovato-lanceolatis concavis lævibus, nervo attingente, perichætialibus setam omnino vaginantibus obtusiusculis enervibus, capsula oblongo-cylindracea curvata strumosa, ore obliquo, operculo subulato basi gibboso. *Hook. Musc. Exot. t.* 17. *A. Rich. Fl. Nov. Zel. p.* 50.—Dicnemon calycinum. *Schwaegr. Sp. Musc. Spreng. Syst. Veg.* 4. *p.* 172. *Brid. Bryol.* 2. *p.* 215.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* Northern Island, Bay of Islands.—1834, *R. Cunningham.*

7. ZYGODON. *Hooker.*

Seta terminalis. *Peristomium* duplex: *ext.* e dentibus 16 per paria approximatis; *int.* e ciliis totidem horizontalibus. *Calyptra* dimidiata brevis.

89. Z. *conoideus*. *Hooker et. Tayl. Musc. Brit. t.* 21. *Spreng. Syst. Veget.* 4. *p.* 184.—Bryum conoideum. *Dickson.*

New Zealand. *Sprengel.*

8. ORTHOTRICHUM. *Hedw.*

Seta terminalis. *Peristomium* duplex; *ext.* e dentibus 16 per paria approximatis; *int.* e ciliis 8—16 vel nullum. *Calyptra* mitriformis.

90. O. *prorepens*; caule repente, ramis erectis, foliis ovato-attenuatis obtusis dorso carinatis, nervo excurrente, seta longiuscula exserta, capsula exacte ovali lævi, calyptra pilosa. *Hook. Musc. Exot. t.* 120. *Spreng. Syst. Veg.* 4. *p.* 184. *A. Rich. Fl. Nov. Zel. p.* 51.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

91. O. *longirostrum*; caule repente, ramis erectis, foliis lanceolato-acuminatis striatis siccitate tortis, seta longa, capsula ovali-elliptica, ciliis nullis, dentibus 16 vix per paria approximatis. *Hook. Musc. Exot. t.* 25. *A. Rich. Fl. Nov. Zel. p.* 51.—Macromitrion longirostre. *Schwaegr. Spreng. Syst. Veg.* 4. *p.* 161.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies.*

92. O. *longipes*; caule procumbente, ramis erectis, foliis ovato-lanceolatis striatis siccitate tortis, seta longissima, capsula ovali-elliptica, ciliis nullis, dentibus 16 per paria approximatis. *Hook. Musc. Exot. t.* 24. *A. Rich. Fl. Nov. Zel. p.* 51.—Macromitrion longipes. *Schwaegr. Spreng. Syst. Veg.* 4. *p.* 161.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies.*

93. O. *gracile*; caule erecto elongato ramoso, foliis lanceolato-subulatis flexuosis siccitate tortis, seta breviuscula, capsula ovata, ciliis nullis, dentibus 16 per paria approximatis. *Hook. Musc. Exot. t.* 27. *A. Rich. Fl. Nov. Zel. p.* 52.—Macromitrion gracile. *Schwaegr.—Spreng. Syst. Veg.* 4. *p.* 161.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

9. NECKERA. *Hedw.*

Seta lateralis. *Peristomium* duplex: *ext.* e dentibus 16 erectis liberis; *int.* e ciliis totidem cum externis alternantibus.

94. N. *planifolia*; caule erecto pinnato, foliis bifariam imbricatis late ovatis acutis enervibus serrulatis, seta longe exserta, capsula cylindracea, operculo subulato. *Hook. Musc. Exot. t.* 23. *Spreng. Syst. Veg.* 4. *p.* 186. *A. Rich. Fl. Nov. Zel. p.* 52.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (North Isle), Bay of Islands.—1834, *R. Cunningham.*

95. N. *setosa*, caule erecto ramoso, foliis confertissimis e lata basi subulato-setaceis nervosis, seta perichætio duplo longiore, capsula oblonga erecta, operculo rostrato. *Hook. Musc. Exot. t.* 7. *A. Rich. Fl. Nov. Zel. p.* 52. *Spreng. Syst. Veg.* 4. *p.* 186.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (North Isle), Bay of Islands, on decayed trunks of trees.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

10. BARTRAMIA. *Hedw.*

Seta terminalis. *Peristomium* duplex: *ext.* e dentibus 16; *int.* membrana plicata in laciniis 16 bifidis fissa.

96. B. *pendula;* caule subpinnatim fasciculatimque ramoso, foliis longe acuminatis serrulatis striatis nervo attingente, seta longa recta demum laterali, capsula oblongo-cylindracea sulcata pendula. *Hook. Musc. Exot. t.* 21. *A. Rich. Fl. Nov. Zel. p.* 53. *Spreng. Syst. Veg.* 4. *p.* 192.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (North Island), Bay of Islands, on decayed timber. —1834, *R. Cunningham.*

11. CODONOBLEPHARUM. *Schwaegr.*

Dentes interni æquales erecti apice conniventes: *externi* per paria approximati.

97. C. *Menziesii. Schwaegr. Sp. Musc. Suppl. II. p.* 142. *t.* 137. *Spreng. Syst. Veg.* 4. *p.* 194.

New Zealand (Middle Island).—1791, Dusky Bay. *A. Menzies, Esq.*

OBS. Muscus erectus, simplex, foliis lingulatis integerrimis nervosis, capsula pyriformi sulcata. *Spreng. l. c.*

12. BRYUM. *Hedw.*

Seta terminalis. *Peristomium* duplex; *ext.* e dentibus 16; *int.* membrana 16-laciniata, nunc ciliis alternantibus. *Calyptra* mitriformis.

100. H. *pinnata. Sm.—Hook. Musc. Exot. t.* 163. *Spreng. Syst. Veg.* 4. *p.* 198. *A. Rich. Fl. Nov. Zel. p.* 53.—Leskea pinnata. *Labill. Nov. Holl.* 2. *p.* 206. *t.* 253.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*—(Northern Island), Bay of Islands, on the trunks of decayed timber.—1826, *A. Cunningham.* —1834, *R. Cunningham.*

101. H. *quadrifaria. Sm.—Hook. Musc. Exot. t.* 109. *Spreng. Syst. Veg.* 4. *p.* 198. *A. Rich. Fl. Nov. Zel. p.* 54.

New Zealand (Middle Island). Dusky Bay. *A. Menzies, Esq.*

102. H. *rotulata. Sm.—Spreng. Syst. Veg.* 4. *p.* 198. *Hook. et Grev. in Edinb. Phil. Journ.* 2. *p.* 282.

New Zealand (Northern Island), Bay of Islands.—1834, *R. Cunningham.*

13. LESKEA. *Hedw.*

Seta lateralis. *Peristomium* duplex; *ext.* e dentibus 16; *int.* membrana 16-laciniata, ciliis nullis. *Calyptra* dimidiata.

103. L. *sulcata;* caule erecto superne ramoso, ramis pinnatis, foliis undique imbricatis erectis appressis ovato-cordatis acutis striatis, nervo attingente, seta breviuscula, capsula cylindracea sulcata, operculo rostrato. *Hook. Musc. Exot. t.* 164. *Spreng. Syst. Veg.* 4. *p.* 192.

New Zealand (Northern Island). Bay of Islands.—1834, *R. Cunningham.*

104. L. *ericoides;* caule elongato ramoso tereti, foliis arcte imbricatis erectis ovatis subacuminatis striatis enervibus integerrimis apice recurvo, seta brevi, capsula oblonga erecta sulcata, operculo subulato. *Hook. Musc. Exot. t.* 28. *Spreng. Syst. Veg.* 4. *p.* 190. *A. Rich. Fl. Nov. Zel. p.* 54.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

105. L. *mollis,* caule pendulo longissimo flexuoso, foliis caulinis remotis spathulato-lanceolatis, rameis dense imbricatis ovatis acutiusculis concavis, setis abbreviatis, capsula ovata. *Spreng. Syst. Veg.* 4. *p.* 190.

New Zealand. *Hedwig.*

106. L. *concinna;* caule erecto bipinnato inferne nudo, foliis bifariis verticalibus stipulisque oblongis brevi-acuminatis marginatis apice serratis, nervo attingente, seta brevi, capsula erecta, operculo subulato. *Hook. Musc. Exot. t.* 34. *A. Rich. Fl. Nov. Zel. p.* 54.—Hookeria concinna. *Spreng. Syst. Veg.* 4. *p.* 199.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

14. HYPNUM. *Dillen. L.*

107. H. *spiniforme,* caule erecto subsimplici, foliis subbifariam confertis lineari-subulatis serrato-denticulatis, nervo excurrente, pedunculo subbasilari, thecæ ovato-arcuatæ operculo oblique conico-rostrato. *Endl. Prod. Fl. Nov. Zel. p.* 3. *Hedw. Musc. Frond.* 3. *p.* 59. *t.* 25. *Spreng. Syst. Veg.* 4. *p.* 199.

New Zealand (Middle Island). Bay of Islands.—1834, *R. Cunningham.*

108. H. *spininervium,* caule erecto fasciculato, foliis laxis bifariis ovatis denticulatis, nervo dorso denticulato ad apicem attingente, capsula sulcata cylindracea cernua. *Hook. Musc. Exot. t.* 29. *Spreng. Syst. Veg.* 4. *p.* 199. *A. Rich. Fl. Nov. Zel. p.* 55.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (Northern Island), Bay of Islands.—1834, *R. Cunningham.*

109. H. *bifarium,* caule erecto subpinnatim ramoso, foliis distantibus bifariis lanceolatis marginatis serratis, nervo ad apicem attingente, capsula ovata horizontali, operculo rostrato curvato. *Hook. Musc. Exot. t.* 57. *Spreng. Syst. Veg.* 4. *p.* 199. *A. Rich. Fl. Nov. Zel. p.* 55.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies.* (Northern Island), Bay of Islands.—1834, *R. Cunningham.*

110. H. *distichum,* caule erecto sim-

plici, foliis distichis ovato-oblongis acutis, apice dentatis, nervo apicem subattingente, seta basilari, capsula cylindrica horizontali, operculo curvirostro. *Spreng. Syst. Veg.* 4. *p.* 199. *Swartz in Schrad. Journ.* 4. *p.* 179. *t.* 3.—Rhizogonum distichum. *Brid. Bryol.* 2. *p.* 665.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

111. H. *amœnum;* caule decumbente vage ramoso, foliis linearibus acuminatis subserrulatis falcatis teneris, capsula urceolata cernua. *Spreng. Syst. Veg.* 4. *p.* 202.—H. Chamissonis. *Hornsch. in Hor. Phys. Berol.* 60. *t.* 13. *f.* 1.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

112. H. *tenuirostre,* ramis erectis, foliis falcato-secundis ovatis longe acuminatis subintegerrimis enervibus, capsula oblongo-ovata cernua, operculo longirostrato. *Hook. Musc. Exot. t.* 111. *A. Rich. Fl. Nov. Zel. p.* 57.—H. leptorhynchon. *Spr. Syst. Veg.* 4. *p.* 203.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

113. H. *aciculare,* caule adscendente vage ramoso, foliis late ovatis acuminatis undulatis apice subserratis enerviis, capsulæ oblongæ-curvatæ operculo longo-rostro subulato. *Spreng. Syst. Veg.* 4. *p.* 204. *Brid. Musc.* 2. *p.* 159. *t.* 5. *f.* 8. *A. Rich. Fl. Nov. Zel. p.* 56.

New Zealand (Northern Island). Bay of Islands, in wet woods.—1834, *R. Cunningham.*

114. H. *gratum,* caule repente bipinnato, foliis cordato-acuminatis integerrimis erectiusculis siccitate apice inflexis, seta scabra, capsula oblonga horizontali, operculo rostrato. *Spreng. Syst. Veg.* 4. *p.* 204.

New Zealand (Northern Island). Bay of Islands.—1834, *R. Cunningham.*

115. H. *comosum,* caule erecto, ramis superne verticillato-fasciculatis, foliis confertis patulis lanceolatis cuspidatis dentatis, nervo valido excurrente, capsula pendula sulcata, operculo curvirostro. *Spreng. Syst. Veg.* 4. *p.* 205. *Labill. Nov. Holl.* 2. *p.* 107. *t.* 253. *f.* 2.

New Zealand (Northern Island). Bay of Islands.—1834, *R. Cunningham.*

116. H. *Menziesii,* caule erecto, apice dense fasciculatim ramoso, ramis deflexis, foliis undique imbricatis ovatis mucronulatis apice serratis nervo excurrente dorso denticulato, capsula cylindracea pendula, operculo conico-acuto. *Hook. Musc. Exot. t.* 33. *Spreng. Syst. Veg.* 4. *p.* 205. *A. Rich. Fl. Nov. Zel. p.* 55.

New Zealand (Middle Island).—1791, *A. Menzies, Esq.* Astrolabe Bay.—1827, *D'Urville.* (Northern Island), Bay of Islands.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

117. H. *neckerioides,* caule erecto inferne denudato, sursum pinnato, foliis undique imbricatis laxis ovatis obtusis apice serrulatis, nervo ante apicem evanescente, capsula oblongo-ovata inclinata. *Hook. Musc. Exot. t.* 58. *Spreng. Syst. Veg.* 4. *p.* 208. *A. Rich. Fl. Nov. Zel. p.* 55.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

118. H. *Arbuscula,* caule erecto bipinnatim ramoso, foliis undique imbricatis ovatis concavis integerrimis basi obsolete binervibus, seta brevi, capsula erecta ovata. *Hook. Musc. Exot. t.* 112. *Spreng. Syst. Veg.* 4. *p.* 210. *A. Rich. Fl. Nov. Zel. p.* 56.—Hookeria Arbuscula. *Sm. in Linn. Tr.* 9. *p.* 280. *f.* 23.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

119. H. *flexile* (*Sw.*), caule elongato flexuoso ramoso, foliis imbricatis late ovatis valde concavis obtusis integerrimis enervibus, capsula ovato-cylindracea erecta. *Hook. Musc. Exot. t.* 110. *Spreng. Syst. Veg.* 4. *p.* 210. *A. Rich. Fl. Nov. Zel. p.* 56.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (Northern Island), Bay of Islands.—1834, *R. Cunningham.*

120. H. *Mougeotianum,* foliis distichis sessilibus oblongis undulatis, longissime acuminatis setosisque stipulaceis alternis dimidio brevioribus, perichætialibus basi coalitis lanceolatis apice in seta gracili longa sensim desinentibus, capsula oblonga arcuata subcernua, operculo longirostrato. *A. Rich. Fl. Nov. Zel. p.* 57.

New Zealand. *D'Urville,* 1827.

Obs. "Nous avons dédié cette jolie espèce nouvelle à notre excellent et savant ami M. le Docteur Mongeot, qui a bien voulu nous éclairer de ses lumières dans la partie cryptogamique de nôtre travail." *A. Rich.*

15. Racopilum. *Palis. Prodr.* 36.

Peristomium duplex, *exterius* dentes 16 lanceolati apice aristati; *interius* membrana carinato-sulcata in cilia 16 perforata, ciliolis interjectis divisa. *Calyptra* mitræformis, campanulata, glabra, latere fissa basique laciniata. *Theca* inæqualis, sulcata, annulata. *Endl. Prodr. Fl. Norf. p.* 4.

121. R. *tomentosum. Brid. Bryol.* 2. *p.* 719. *Endl. loc. cit.*—Hypnum tomentosum. *Swartz. Prodr.* 141. *Hedw. Musc. Frond.* 4. *p.* 48. *t.* 19.

New Zealand (Northern Island). Humid woods, on the shores of the Bay of Islands.—1834, *R. Cunningham.*

(To be continued.)

REMARKS ON M. SPACH'S MEMOIR ON THE CISTACEÆ.

(In a letter addressed to the Editor of this Journal.)

London, April 4th, 1837.

My dear Sir,—In the last number of the Companion to the Botanical Magazine, p. 283, is a note upon *Cistaceæ*, so remarkable, that I actually rubbed my eyes, in the belief that I was either dreaming while I read it, or that I had been writing some elaborate monograph of that Order, without being aware of it. "We conceive," says the author of the note in question, "we conceive Dr. Lindley to have taken a wrong view of the matter, in characterizing *Cistaceæ*," &c.—"Dr. Lindley seems almost equally in error in most of his other statements;"—and further on, the same Dr. Lindley is charged, with mistaking one thing, misunderstanding another, and so forth. However, upon looking to the name of the author of so learned a piece of criticism, the mystery was explained; for it turned out to be only a new specimen of the ingenuity for which Mr. Spach has gained so much notoriety. I should therefore have thought no more about it, if it had not appeared in the pages of a Journal, of which the Regius Professor of Botany at Glasgow is the Editor; but I have too much regard, both for the Editor of that work, and for the work itself, to allow me for a moment to suppose, that he would wish so strange and unjust a piece of criticism to pass unnoticed. You must therefore forgive me for calling your attention to—all that is worth thinking about—the candour and justice of the writer; especially, as a very near friend of your own is, as I shall presently show you, quite as much in the scrape as I am.

What Mr. Spach is pleased to call the "wrong views," "errors," "mis-statements," "misunderstandings," blunders, and I can't tell what besides, are really enough to break the back of any poor creature's reputation, and I dare say nothing short of the annihilation of so humble an individual as myself is looked for as the result of such a thunder-clap. Writers, however, should always be careful, when they fire their great guns, not to expose themselves to the *ricochet* of their own shot, and I would most particularly recommend this maxim to Mr. Spach's consideration.

In the present case, it happens that the errors, mis-statements, &c. aforesaid, do not belong to me, but to the actual state of systematic Botany. They have not originated in any observations or mis-observations of mine; but have been simply recorded by me, in the course of a general work, as the received opinions of the best authorities of the day. Had I either written a critical monograph of the Order, like M. Dunal, or generalized upon a few solitary observations regarding outlying species, after the fashion of Mr. Spach, it would have been very well to lay the errors, provided always that the errors are proved, at my door; but, as I am unconscious of having put forward any claim to originality in the matter, I really do not see why I should usurp to myself all the honour of Mr. Spach's vituperation.

This gentleman sets up for a model of exact observation—

> He can distinguish and divide
> A hair 'twixt south and south-west side;
> Knows more than forty of us do,
> As far as words and terms can go;

and therefore it behoves me to be very particular, first, in proving my want of all title to the compliments he has paid me; and secondly, in showing to whom they really do belong as much as to me. You will find in the first of the following columns, the errors, blunders, mis-statements, misconceptions, misunderstandings, &c. alleged to be chargeable upon myself, and in the three other columns parallel passages from the writings of gentlemen whose authority I do not think you likely to call in question;

JOHN LINDLEY. *Natural System of Botany*, 1836.	PROF. DE CANDOLLE. *Prodr. Syst. Nat. Regn. Veg.* v. 1. 1824.	G. W. ARNOTT, Esq. *Article Botany in the Edinburgh Encyclopædia*. 1832.	Sir W. J. HOOKER, LL.D. *Smith's Introduction to Botany*, ed. 7. 1833.
Stigma simple.	Stigma simplex.	Stigma simple.	Stigma simple.
Petals crumpled and twisted.	Petala contorta.	Petals in æstivation twisted and corrugated.	Petals wrinkled and twisted in æstivation.
Petals fugitive.	Petala caduca.	Petals very caducous.	Petals caducous.
—— 5.	—— 5.	—— 5.	—— 5.
Stamens indefinite.	Stamina indefinita.	Stamens indefinite.	Stamens indefinite.
Fruit either one-celled, with parietal placentæ in the axis of the valves, or imperfectly 5—10-celled, with dissepiments proceeding from the middle of the valves, and touching each other in the centre.	Capsula constans valvis 3—5, rarius 10, nunc medio nervum longitudinalem placentarium gerentibus et tunc capsula 1-locularis, nunc nervo medio in septum plus minusve completum abeunte, et tunc capsula completè aut incompletè multilocularis.	Fruit capsular, 3—5—10-valved, 1-celled, with parietal placentæ in the middle of the valves, or imperfectly 5—10-celled, with dissepiments proceeding from the middle of the valves and meeting in the axis of the fruit.	Capsule 3—5—rarely 10-valved, 1-celled, with the valves having a single longitudinal placenta, or 3—5-celled, the dissepiments from the centre of the valves extending to the axis.
Seeds indefinite. Albumen mealy.	Semina plurima. Albumen farinosum.	Seeds indefinite. Albumen mealy.	Seeds numerous. Albumen mealy.
Embryo spiral or curved.	Embryo spiralis aut curvus.	Embryo spiral or curved.	Embryo spiral or curved.

Can it be necessary to say any thing more? Surely, after this explanation, Mr. Spach and his criticism may be dismissed. Another time, your *learned* correspondent will, perhaps, take care, when his remarks are personal, to which there can be no sort of objection, that he gets hold of the *right person*.

I would only add, that although for argument's sake I have treated Mr. Spach's remarks as if they were in themselves well founded, yet that I do not in fact admit any such thing. On the contrary, there would be no difficulty, if it were worth the while, in justifying every one of the characters so unceremoniously condemned. But it is obvious that arguments are thrown away upon a person so palpably ignorant of the first principles of classification as not to know the difference between an ESSENTIAL CHARACTER and a NATURAL CHARACTER, and who admits that he cannot understand the meaning of such an expression as "ovules with the foramen at their apex."

Pray believe me, my dear Sir,

Your's faithfully,

JOHN LINDLEY.

BOTANICAL INFORMATION.

NEW BOTANIST'S GUIDE, VOL. II.

WE are requested by Mr. Hewett Watson, to make public the accidental destruction, by fire, of the whole impression of the second volume of the New Botanist's Guide, when just ready for publication. Mr. Watson adds, that other engagements will prevent him reprinting the volume at present, and he fears that much time will elapse before he can give any further attention to it. On which account he is desirous to give this explanation of the non-appearance of the work, to the many correspondents who had sent communications for it.

Mr. William Gardiner, jun., of Dundee, a most zealous and industrious Botanist, has issued the following Prospectus of a new work, entitled, "MUSCI ANGUSIANI, or dried specimens of the Mosses of Angus or Forfarshire."

"The work will be comprised in about

seven or *eight* 12mo. fasciculi—price 3s. 6d. each—forming *two* neat pocket volumes.

"On the left-hand page of each leaf, one, two, or more specimens of a species will be carefully gummed, with the *scientific* and *English name*, reference to the page of the *British Flora* where the species is described, *locality*, and *time when found*, —all accurately written underneath.

"With the concluding fasciculus will be given, along with title-pages for both volumes, a printed table of the contents of each, arranged according to Sir W. J. Hooker's *British Flora*, and including A SYNOPSIS OF THE GENERIC AND SPECIFIC CHARACTERS.

"A blank will be left at the top of each page for numbering the species, and by means of the tables, the specimens can be numbered and arranged with the greatest ease; while the numbers not being attached to them when published, will allow of any subscriber adopting whatever mode of arrangement he chooses, as well as of the Author adding species that may be found during the publication of the work.—Fasciculus 1st will be published in May 1837.

"Subscribers' names will be received by the Author, at Mr. George Robertson's, merchant, 18, Overgate, Dundee.

"W. H. White, Esq., London, has also kindly undertaken to receive subscribers' names for the Author."

A very neat specimen of the work has been sent to us, by which it appears, that the individual Mosses are extremely good, and very neatly arranged. Twenty species will be given in each Fasciculus, of which one will be published every alternate month.

Another enthusiastic and moreover very accomplished Botanist, Dr. J. F. Lippold, at the suggestion of William Christy, jun., Esq., and some other Naturalists, is now investigating the Island of Madeira. Previously to embarking, he issued the following PROSPECTUS, to which we are anxious to give still greater publicity.

"PROSPECTUS.

"The Island of Madeira is well known to be one of the points most favoured by nature; and it is especially by its rich and varied vegetation, uniting the products of two zones, that it interests the Naturalist. The undersigned (for a long time a most passionate amateur of Botany and Horticulture), knowing that there are many English Botanists and Horticulturists who wish to have collections of dried or living plants, of seeds, of bulbs, &c., from that delightful island, proposes to go there himself, as *a collector of plants in particular, and of other objects of Natural History in general.*

In order to effect this project, he offers to amateurs *a subscription* under the following conditions:—

"1. Each subscriber will receive, for a subscription of £5, three hundred indigenous plants of Madeira, carefully dried in the German manner; or one hundred species of seeds, bulbs, roots, &c., whichever he prefers, dried or living.

"2. The undersigned engages himself to go to Madeira as soon as he has fifteen subscribers.

"3. The conveying of the plants, seeds, &c., will be at the risk and expense of the subscribers; the undersigned only insures their package.

"4. The distribution of the transports of plants will be in the order of the date of the subscriptions.

"5. If any amateurs of insects, shells, or minerals, wish to receive collections of them from Madeira, the undersigned will willingly execute their commissions, received by W. Christy, jun., Esq., who undertakes to make the necessary arrangements in this department.

"6. W. Christy, jun., Esq., Clapham Road, London, will have the kindness to receive subscriptions for the undersigned,

"Dr. J. F. LIPPOLD.

"London, November, 1836."

Dr. Lippold safely reached that interesting island, as we are informed by Mr. Christy, after a voyage from the Thames of ten days. He writes in extasy on the luxuriance of the vegetation, though he had then seen nothing but Funchal and its environs. Mr. Lowe received him most

kindly, and offered him every assistance in his power in pointing out plants, naming the rarer species, &c. &c. He has already become acquainted with a wealthy Portuguese gentleman, who possesses a very fine garden, and who has kindly given him a piece of ground wherein to sow his seeds. He took out with him about three hundred different seeds, and by a vessel which has since sailed, Mr. Christy has sent out to him many more, and also a basket of *Cacteæ, Stapeliæ,* and *Mesembryanthema,* together with many kinds of Indian *Chrysanthemum,* all of which are highly prized in that island, and will be valuable in the way of exchange. By the same ship Mr. George Loddiges dispatched to him in one of Mr. Ward's admirably contrived cases, *Araucaria excelsa, Berberis fascicularis, Benthamia fragifera, Deutzia,* many succulent plants, &c. Thus will the visit of Dr. Lippold to Madeira occasion an interchange of vegetable products, which cannot fail to be advantageous both to that island and to England. Collections of dried plants may be expected to be dispatched in about two months from the date of his arrival, and may be looked for by us some time in June.

Mr. Lowe, as may be supposed, has taken a great interest in the success of Dr. Lippold, as will be seen by an extract from a letter just received.—" The sight of your hand-writing again was most welcome to me indeed: but as far as Dr. Lippold was concerned, Mr. Christy, by mentioning your name, had already engaged me sufficiently to do all in my power for him. I have introduced him, shown him about, and shall continue to help him as far as I can. He seems to be very diligent and active, and is really a well-informed and superior man upon other subjects besides Botany. I have been highly delighted to find in him a kindred passion for my favourite Klopstock. At present he has enough to do with our " *Regio maritima.*" Next month and the following, I shall get him off into the mountains. It was too late for two or three of the best plants. I took him to the stations of *Chamæmeles* and *Sideroxylon:* but the flowers were over. Dr. Charles Lemann, a friend of Dr. Boott's, has been here all winter. He is an excellent and active Botanist, and has made a capital Herbarium. Altogether, this spring has been quite a revival in Botany for me; and you need not be surprised to see, ere long, in the Cambridge Transactions, a " *Novitiæ Floræ Maderensis,*" for which I have collected some twenty or thirty new, unpublished, or obscure species. If Lippold is to accomplish any thing effectual here, he should not go away before July. But on the other hand, I see no use in his staying after that time, unless he remains altogether till the following spring, which certainly is not advisable, since I do not believe by doing so he would add one hundred and fifty species to what he may secure before July. Pray have his friends never thought of the Cape de Verd Islands for him? There he would have almost a virgin soil, in a tropical climate. Several of the islands are said to be covered with forests, and are untrodden by an European. One (Fayo) is an active volcano. Lippold could get there easily from here: still more easily probably from the Canaries. But I do not know at all how he might relish such a scheme. Lemann has made a great discovery for me, in the *Teucrium heterophyllum,* L'Hérit. in flower. It is a lovely plant, well worthy culture, if the flowers would preserve, in a greenhouse, their very peculiar colour (a sort of flame or dull orange-red). The other day I found myself a new plant for my Flora, *Trifolium Cherleri,* L., already, indeed, in Von Buch's list, but which had escaped me. Lemann has also found Madeira stations for three or four of my Porto Santo plants."

Whatever may be Dr. Lippold's place of destination after he will have left Madeira, there can be no doubt he will visit some more interesting and more productive region than that which now engages his attention; and we shall not fail to inform our readers as soon as the country is fixed upon. The Atlas Mountains and Spain have been suggested as likely to afford an excellent harvest to a collector, but an accomplished Naturalist, than whom none is

more competent to speak on the subject, has convinced us, that neither of those countries, however tempting by their productions, can be visited with safety. Mr. Webb thus writes upon that subject from Paris:[1]

"Going to so circumscribed a spot as Madeira, would certainly not answer for any great length of time, but a visit to the Mauritanian Atlas is of very doubtful practicability. I can speak with certainty on this point, having done all in my power to accomplish the enterprise myself. The only method of travelling in the interior of Morocco is, in company with a foreign Consul, sent to the Court of the Emperor by his Government. This may always be known by writing beforehand to Tangiers. Mr. Consul Douglas was going, in 1827, from the English Government, and he kindly procured for me a tent from the Governor of Gibraltar with those for himself, and I made every other preparation of presents and necessaries fit for a Frank Bey attached to the mission; but from various causes it never took place, and after exploring the country in all directions about Tangiers and Tetuan, I embarked for Gibraltar. Since that time, I believe in 1829, Sir Peter Schousbee's sons accompanied an Austrian Envoy to Morocco, and being perfect Mauritanians, born and bred in Africa, they easily obtained permission to visit the Atlas Chain, and brought back a store of plants. If any friend of yours does ever go to Morocco, I would recommend him, beside the great Atlantic Alps, to visit the Cordilleras and beautifully wooded valleys between Mount Cif and Tarudanh, often described to me by the Shihas or Barbèrs, whom I saw at Tangiers. The country round about the fallen cities of Fez and Mequinez merits little attention, but the impracticable province of El Rif, composed of lofty chains, lying between Tetuan and the Algerine territory, will be a rich mine of botanical knowledge whenever it can be got at, which will not be yet awhile, for the Rifeños are a savage indomitable race. I have specimens of *Larix Cedrus* from the Rif Mountains, and am informed that great forests of this noble Fir are still to be found there. Both Mauritania and Numidia, now as heretofore, suffer from a scarcity of water, and it appears by what I could learn from the Moors, that the streams which flow from the Atlantic Chain descend principally on its eastern side, and enrich an El Dorado of vegetation, concerning which they speak in raptures. When shall we Giaours, know aught of these countries? For my own part, I look forward to the triumph of Europe and civilization through the French occupation, if the nation have perseverance and steadiness enough to consummate its conquest, a task worthy of the Romans.

"I should think Gibraltar excellent head-quarters for a Spanish herborizer, the Sierra de Rorida, where I found the *Digitalis laciniata* (Bot. Reg. t. 1201), and a multitude of other Sierras are within a day or two's reach, and in the shady ravines, between Gibraltar and Medina Sidonia, I had the pleasure of finding *Rhododendron Ponticum*, growing in splendid bushes, twelve feet high. I cannot answer for that part of Spain just now, but even when I was there in 1827, it was not safe to wander about, except in companies of two or three together, not so much on account of the professional robbers, as of what the Spaniards call *raterillos*, or attacks from the peasants, armed with their knives; but as they are cowardly, and had at that time no fire-arms, they are little to be dreaded by armed men, determined to defend themselves. I botanized thus throughout the Sierra Nevada, the Alpux-

"[1] His Grace the Duke of Bedford confirms the statement, so far as regards the South of Spain:—"During an expedition I made in Spain, on horseback, in 1814, I rode from Cadiz to Gibraltar, and in the woods between Tariffa and Algesiras, saw most splendid natural clumps of the *Rhododendron Ponticum*, then in full flower (April), and growing from twelve to fifteen feet high. I then rode from Malaga to Grenada, and the whole line of conntry I traversed seemed most interesting to a Botanist; but at that time so much danger attended these excursions from the numerous Brigands, that the Spanish commanding officers at Cadiz and Malaga, gave me escorts of dragoons to protect my life."

erras, and the greater part of the mountains of Andalusia, and was never attacked. The tranquillity of Portugal, where the Botanist had no need of pistols in his girdle, or gun at his shoulder, was, after this, a paradise."

We are happy to find that Mr. George W. Francis, of London, has put it in the power of the student of Botany to study the British Ferns by a remarkably cheap publication, which contains figures (on a reduced scale indeed) and descriptions of all our genera species. The figures are all engraved by Mr. Francis himself, and the descriptions appear to be drawn up with considerable care, and the stations to be very full and satisfactory. The size is a thin 8vo., and the price only 4s.

Russia, and indeed all Europe, has lately had to deplore the sudden death of a very admirable Botanist, in the person of John Prescott, Esq. of St. Petersburg, one of the first merchants in that place. His leisure hours were devoted to the study of plants and the enriching his Herbarium, which latter is perhaps exceeded but by few in Europe, especially that portion of it relating to the Russian Empire. Some idea of its extent may be formed by the following circular, which has been issued by his friends with the view of offering it for sale, and the price of £1,000, if we are rightly informed, has been set upon it.

HERBARIUM OF THE LATE JOHN D. PRESCOTT, ESQ., OF ST. PETERSBURGH, 1837.

This Herbarium may be safely warranted to contain twenty-five thousand species; it is arranged according to the natural method; each species is laid into one or more sheets of fine, stout, white, unsized paper, made expressly for the Herbariua of the Academy, the Botanical Garden, and of J. D. Prescott; and the genera are separated by pasteboard. All the specimens are carefully ticketed, so that no doubt can exist concerning their origin: of by far the greater part of the species, there are several specimens from different sources; all of them are distinguished. About twenty thousand species are arranged in the great Herbarium; and five thousand, received within the last two years, are arranged in natural order as Inserenda. There are, besides, a great many duplicates, chiefly of Siberian and Caucasian plants, in separate packets—certainly several thousand specimens.

The Herbarium was founded originally on the collection of M. Hermann,—who was many years attached to Count Razoumoffsky's Botanical Garden at Gorenki, and who travelled for the Garden, in company with Tauscher,—containing about four thousand species, chiefly Russian plants, collected by him, and communicated to him by Adams, Henning, Marshall Bieberstein, Steven, &c.; also many of the rarer species cultivated at Gorenki—but no exotic wild plants. The additions to this were rapid:—by purchase were acquired,

Europæan Plants:—Schleicher, Hoppe, Lang, &c. &c.

Sieber's collections, the whole five thousand species (with the exception of the *Flora Palestina*).

Cape Plants:—Kneps, Ecklon.

Cuming's Chilian Plants.

Caucasian:—from Wilhelms, Hohenacher, &c.—*Sarepta*, Wanderlich.

Dr. Blume's Herbarium, of three thousand species; containing a complete *Flora Astracanica*, and many from the Caucasus and *North Persia*, collected by Haussan.

Pœppig's Collections:—three thousand species; Peru, Chili, Maynas, Flora Amazonium. By correspondence the Herbarium was materially increased, as will be best shown by a geographical statement.

Russia:—this is the richest part of the Herbarium; it contains nearly all the species hitherto discovered in the Russian dominions.

Flora Petropolitana (in separate portfolios), collected by J. D. P.—complete.

Ukrania:—Flora of Elizabethgrad, from Boshniak—Catherinoslaff, Haufit.

Flora of Odessa, from Compère, and many other collections.

Tauria:—Flora almost complete, from the contributions of Compère, and specimens from the Herbaria of M. Bieberstein, Steven, &c.

Caucasus:—very complete Flora from Wilhelms, Hohenacher, Hoffs, and many friends.

North Persia:—many plants from Meyer, ex *Cauc. Casp.*—Haussan, Hohenacher, Gmelin, jun.—Herl, &c.

Turcomania:—many plants from Kardin and some other sources.

Altai:— the plants communicated by Yebler, Ledebour, Meyer, Bunge, and Fischer, make the Flora nearly complete.

Siberia—from other parts; most extensive collections from Tourtschaninoff, Vladzimirtsky, &c. The former communicated specimens of all the plants he found in his extensive travels.

Kamchatka:—many plants from Dr. Mertens; Kastatsky, Dr. Fischer, besides those from the above Herbaria, and that of Steven, M. Bieb., &c.

North China, Mongolia:—the plants collected in the late mission to Pekin, by Bunge, Tourtchaninoff.

North-West America and *Aleutian Islands*:—very extensive collections from the Russian travellers, Dr. Mertens, Kastatsky, &c. The *Flora Sitkensis* from Dr. Mertens—communications from Douglas, Scouler, &c.

Europe:—pretty complete collections; but as these are the least interesting, I shall not enumerate the different sources from which they are derived.

The Orient:—a very considerable collection from Aucher Eloy, gathered in Syria, Palestine, Egypt, and Arabia; many unpublished plants. Sieber, *Fl. Egypt.*

North America: — the plants of the English Arctic travellers, from Hooker, Lindley, Greville, &c. Douglas' collections complete from himself.

Canada:—from Goldie and the above. *Southern States*, a very complete collection; two thousand specimens from Nuttall; collections from Torrey, Grey, &c. (a very rich part of the collection).

West Indies:—plants from *St. Domingo*, by Jager; *Trinidad*, Sieber, Hooker; *Cuba*, Pœppig; *Martinique*, Sieber.

Caraccas:—a small but interesting set; two hundred species from Sir R. Porter.

Chili, Peru:—Pœppig's Plants; Cuming's, as published in Hooker's Bot. Misc. Plants from Dr. Mertens, Kastatsky, &c.

California:—a few plants from Kuchelbecker.

Brazil:—the Herbarium contains about five thousand species, principally collected by Riedel, in Langsdorff's Expedition—by far the greater part undescribed. There are also fifteen hundred from Rio, collected by Lushnath, and many from other sources, as Mertens, Kastatsky, Hooker, Lindley, &c.

Cape of Good Hope:—Ecklon's collections; two thousand species, and a good many from other sources—as Mertens, Kastatsky, Emerson, &c.

Senegal:—Sieber's Flora Senegalensis and a few from Forbes.

Madagascar:—a very small number, communicated by Lindley.

Mauritius:—Sieber's Fl. Maur., and some from Hooker.

East Indies:—full three thousand species, communicated by Wallich (Wall. Cat.), a few from Wight and Arnott, and some from other sources. Plants from *Manilla, Bonin,* and *Guakam,* from Mertens and Kastatsky.

Islands of the South Seas:—Otaheite, Owaihee, Radak, from Mertens, Kastatsky, and others.

St. Petersburg, Feb. 1837.

Alphabetical List of the places whence the specimens in the above Herbarium have been obtained.

Aleutian Islands. Altai. America, North and North-West. Bonin. California. Canada. Cape of Good Hope. Caraccas. Caucasus. Chili. China, North. Europe. Guakam. Indies, East and West. Kamchatka. Manilla. Mauritius. Maynas. Madagascar. Mongolia. Odessa. Orient. Peru. Persia, North. Petropolitana. Russia. Siberia. Senegal. South Sea Islands. Tauria. Turcomania. Ukrania.

We are not aware that Mr. Cuming, who is collecting in various branches of Natural History in the Philippine and adjacent islands, has written to any of his botanical friends since his departure. But a mercantile friend of our's in Glasgow, has received a letter from a correspondent at Manilla, who met with Mr. Cuming, and traversed with him a considerable portion of the mountainous district of Lucon, a region probably never before trodden by an Europæan, certainly not by an Europæan Naturalist. The result of that excursion alone is stated to be a very considerable collection of plants, especially of Ferns.

We have the pleasure to announce the first arrival of dried Brazilian plants from Mr. George Gardner, whose visit to South America has already been announced; and the several packages addressed to the different subscribers, will be forwarded to them immediately. From what we have yet seen of the specimens, they are exceedingly well preserved, all of them numbered with corresponding figures, and many of them (as far as Mr. Gardner had the opportunity of doing so) are named. A list of them will be hereafter published in this Journal. In the mean while, we are anxious to present our readers with such extracts from a very long letter which accompanied these plants to Europe, as bear most on the Botany or Natural History generally of the neighbourhood of Rio, or upon Mr. Gardner's prospects as a botanical collector.

"Rio Camprido, near Rio de Janeiro,
"Dec. 18, 1836.

"My dear Sir,—I have to return you my most sincere thanks for the books you were so kind as to send me, all of which, but especially Dr. Lindley's *Natural Orders*, will prove highly valuable. From the date of this letter, you will perceive that I am still in the neighbourhood of Rio, but I mean to leave it, in three days, for the Organ Mountains. My stay here has been prolonged for several reasons. In the first place, I found, in my excursions, so many things that I thought would prove acceptable to my subscribers, that it appeared to me advisable to continue collecting. During this period, I have also been accustoming myself to exposure to the climate, and have picked up a little of the language; besides making acquaintance with several individuals who possess considerable influence in the mining districts, and who will be of the utmost service to me when I shall visit that part of the country.

"In this, my first shipment, I send, including *Cryptogamia*, about four hundred and eighteen species, and above six thousand specimens. I shall wait with much anxiety to learn your opinion about these; but may venture to remark, that I am quite aware a few of the subscribers would have preferred receiving plants from a more inland quarter; so that if any individuals should express the least unwillingness to take these, they may be laid aside along with those parcels which are not bespoken, until some future purchasers should present themselves. As regards the condition which these collections are in, I need not say to you, how much the difficulty of preserving plants is increased by the moisture of this climate, which in the dryest months is very much greater than in England, while during the heavy rains, which never last less than three or four days successively, it is utterly impossible to prevent the larger specimens from becoming covered with a yellowish mould. I have done all that lay in my power to render the collection a good one, and flatter myself that at least it is in as perfect a state as what is generally sent from Brazil. It was needful to send it by London, few vessels ever leaving this place for any other port in England.

"In one of the cases you will find good specimens of the capsules of a species of *Lecythis*, also a box of insects for your son, a small parcel containing *Fungi*, and two packets belonging to myself; one consisting of specimens of the *Rocks* in this neighbourhood, the other a collection of Brazilian *Shells*; these can be sent to my

father's house. The *Ferns* and other *Cryptogamia* that you will find in your own packet, together with all other specimens of this tribe, which I may in future send you, I have to request that you will accept, as a small, but sincere mark of gratitude for the many and valuable acts of kindness you have so freely bestowed upon me. Is there any thing new or rare among the *Mosses?* Some of them are highly beautiful; but of these, I expect to make a much finer collection in the Organ Mountains.

"About three weeks ago, I spent two days at Tejuca, in company with young Mr. Miers, the son of the well-known Chilian traveller; he is enthusiastic in the pursuit of Natural History, and has been my companion in many of my excursions. On the mountain near this place, which lies about fourteen miles to the West of Rio, we found some very fine *Orchideæ*, the beautiful *Cattleya labiata* being the most abundant. Such of this tribe of plants as seemed to be capable of bearing conveyance, I have sent home; one case being for His Grace the Duke of Bedford, to whom I also forward a few *Cacti*—another for Mr. Murray at the Botanic Garden, and the third for Mr. Skirving of Liverpool. Another box lies in the Messrs. Harrisons' warehouse, ready to be shipped in the first vessel for Hamburgh to the Messrs. Booth of that city. To several others of my subscribers for living plants, I shall send collections from the Organ Mountains. The length of time I may remain there depends upon the success I shall meet with. From all I can hear, this is the best season to visit those mountains for flowering plants, so that I anticipate a rich harvest, and mean to send home not only *Orchideæ* in a living state, but *Gesnerias*, and every thing else that may appear worthy of conveyance. The only place of residence to be obtained near the Organ Mountains, is in the house of an English merchant, named March, who possesses a large tract of the country, where he has built several houses, which are generally hired by those families who retire thither to avoid the excessive heat of the summer months. I am to be a boarder in this gentleman's own residence, at the rate of £15 per month, an extremely high price, but as there is no other accommodation to be obtained, I have no option. Mr. Burchell, the African traveller, occupied the same quarters during his stay on the Organ Mountains, and he was my predecessor in the family with whom I now reside near Rio, as was also your protégé, the lamented Douglas. Shortly after my arrival here, I was introduced to Mr. Riedel, a botanical collector in the employ of the Russian government, who has spent fourteen years in this country, and travelled through the greater part of it, having been attached to Langsdorff's expedition. You will find some account of his travels in Loudon's Magazine of Natural History, Nos. 21 and 23. Tweedie was at Rio when I arrived, but we did not meet: he called once on Mr. Miers, but whither he is now gone I know not.

"As yet, I have been unable to find either *Eriocaulons* or *Cephaelis Ipecacuanha*, but expect to procure both in the mining districts. The latter chiefly inhabits the virgin woods, and I shall not fail to gather abundance of specimens, with the view to introduce this interesting plant to England, where it does not at present exist. Nor could I obtain any of the numerous *Palms* about Rio, though I was continually looking out for them, the only one which I met with in a flowering state, having too lofty and smooth a stem for me to reach it. Perhaps I shall be more successful in the Organ Mountains.

"You will observe by the parcels which I send, that, including my own and the one consisting of *Ferns* and *Orchideæ* for Mr. Parker, I have prepared twenty-six sets. This number will, I think, be sufficient, as I shall be quite satisfied if I can procure subscribers for them all. Moreover, I should find it necessary to reduce the amount of species, if I had to dry more specimens of each kind, and as it is, I am often obliged regretfully to pass by many interesting things.

"The intelligence you communicated respecting the good sale of my *Musci Britannici* is highly gratifying to me, and I am well aware that my success is owing to your favourable notice of this little work. Pray get my name put down as a subscriber to Mr. Bentham's work on the *Scrophulariaceæ;* and excuse my troubling you with a request to have my numbers of it sent as early as convenient. I am glad to hear that De Candolle has completed his fifth volume, as such a work on the *Compositæ* will be peculiarly useful to me in this country, where the woody species of this Natural Order are very numerous. Any other cheap and portable botanical books I will also thank you to procure for me. A good work on the *Ferns* is a great desideratum, and if it could be brought out in an 8vo. volume, would surely answer. The descriptions of this tribe in Sprengel are so meagre, that I often am at a loss to make out the species, and many Brazilian Ferns do not seem to be noticed there at all.

"You will perceive that the amount of each parcel is not marked outside. My reason for this is, because Government charges an *ad valorem* duty of 7 per cent. on all exported produce of this country; and as I was at a loss to fix a price on the first case of living plants which I sent home, I left the officers to do so, and as the value they set on it was very low, I mean to make them estimate these also.

"I have paid all possible attention to my specimens, both as regards pressure and frequent change of papers, and yet they are far from being what I could wish.

"As the Organ Mountains lie at the head of the Bay of Rio Janeiro, about half the distance thither is accomplished by water, and the latter half must be performed on the back of mules, three of which animals I have already ordered to be at the landing-place prior to my arrival; two for conveying my luggage, and one for myself. Two English merchants, who are going to spend the Christmas holidays with their families, will accompany me.

"Having said thus much on my future plans, I proceed to give you some account of my excursions in the neighbourhood of Rio, and the nature and aspect of its vegetation. But as an eternal summer reigns in this happy climate, and as almost every plant has its own season for the production of its flowers, every month is characterized by a different Flora. Consequently, a residence but of a few months cannot be expected to afford more than a very partial knowledge of its vegetable riches.

"During the first few weeks, my rambles were confined to the shores, the valleys, and the low-wooded hills in the vicinity of the city. In exploring the shores, I found the vegetation to vary, as might be expected, according to the nature of the soil, which towards the East end of the Bay, where it is muddy, produces thick plantations of *Rhizophora Mangle* and *Avicennia tomentosa,* growing quite into the sea. There also, but on the more elevated parts, *Anacardium occidentale* is found. South of the city the shore is formed of loose white sand, covered with large patches of *Convolvulus Pes capræ,* whose long-rooting shoots bind together the soil much in the same way as those of *Elymus arenarius,* and other creeping grasses, do that of Europe. Here also the glaucous-leaved *Acicarpha spathulata* throws out its spreading branches, while amid these, growing almost into the sea, there is great abundance of *Sophora littoralis,* bushes of which attain the height of four or five feet, and are covered, during the flowering season, with large racemes of yellow blossoms. Intermingled with the *Sophora,* is the *Pitanga* (*Myrtus pedunculata, Linn. ex Spix et Mart. Itin. v.* 1. *p.* 16), which has a fine appearance when loaded with its crimson fruit, about the size of cherries. When the fruit is mature, it becomes nearly black, and has then the delicious flavour of a strawberry; but in its unripe state, the taste is disagreeably acid, and much like turpentine. It is made into preserves by the Brazilians. Twining around the branches of these and of other shrubs along the shore, I found beautiful specimens of *Aristolochia ma-*

crura and *A. rumicifolia*. These sandy shores also abound with a large species of *Opuntia*, *Triumfetta semitriloba*, and several small frutescent species of the genus *Sida*. Where the ground becomes rocky, the vegetable forms again differ. The peculiarities of such places may be well remarked upon a small promontory that juts out into the Bay, about two miles South of Rio. It rises to about one hundred and fifty feet above the sea, and is partly cultivated and partly clothed with its natural vegetation, which exhibits itself in the shape of large shrubs and herbaceous plants, reaching to the very edge of the sea. On the rocky parts, which are apparently quite destitute of soil, several angular *Cacti* spread out their grotesque limbs, and on its nearly perpendicular face, great quantities of a *Brassavola* and a small species of *Tillandsia* have taken up their abode. Where a little vegetable mould has accumulated, a *Gesnera*, an *Epidendrum*, the lovely *Vellosia candida* and its smaller, though equally beautiful, congener, *Barbacenia purpurea*, vegetate and bloom in the utmost luxuriance; and where the soil is deeper, there a natural shrubbery exists, consisting of several kinds of *Melastomaceæ*, *Myrtaceæ*, *Lantanas*, *Crotons*, *Bignonias*, a shrubby *Oxalis*, *Clusia alba*, and some woody *Compositæ*. Rising above these again, are a few small trees, of a spiny species of *Bombax*, and a few of *Cleome arborea*.

"The principal plants seen by road-sides and in waste places, are several fruticose *Malvaceæ*, *Asclepias Curassavica*, a species of *Stachytarpheta*, *Phlomis officinalis*, *Loasa parviflora*, *Gomphrena Basiliensis*, a *Leonurus ?*, *Buddlea Brasiliensis*, *Hydrocotyle Asiatica*, a *Verbena*, *Cuphea*, several *Bignonias* and *Cleomes*, *Scoparia dulcis*, *Senebiera pinnatifida*, var. β. D C., *Stellaria media*, *Sonchus oleraceus*, some *Grasses* and *Ferns*; while, wherever there is moisture, various *Jussiæs* may be seen unfolding their yellow blossoms.

"The hedges by the road-sides, which are mostly formed of *Mimosas*, *Opuntias*, *Pereskias*, and not unfrequently of *Limes*, are festooned with innumerable climbers, the many-tinted blossoms of which, while they gratify the sight, equally regale the sense of smelling by the delicious odours they exhale. They chiefly consist of various species of *Convolvulus* and *Ipomæa*, a *Rubus*, *Dalechampia*, *Mikania*, *Vernonia*, *Eupatorium*, *Aristolochia*, *Paullinia*, *Bignonia*, *Passiflora*, and *Cucurbitaceæ*. It must, however, be observed, that these do not all flower at once, but present a continual succession of bloom.

"The low hills near the city are mostly cleared, and wherever it is practicable, brought under cultivation; but the sides and summits of the loftier ones are still covered with virgin forests, the larger trees of which are fast falling, for the purpose of fire-wood, under the axe of the woodman. The deep valleys intersecting the mountain-ranges, are the chief seats of agricultural industry, and some of them, particularly in the immediate neighbourhood of Rio, are thickly studded with habitations, surrounded by plantations of *Coffee*, *Oranges*, *Bananas*, and *Mandiocca*. No large rivers empty themselves into the Bay, nor into the sea near the city; a few rivulets, which take their rise in the neighbouring mountains, are all that exist. From one of these, the city is supplied with water, conveyed for nearly ten miles in an arched aqueduct that winds along the side of the high land on which the mountain, called the Corcovado, is based. As there is a path by the side of the aqueduct for its whole length, it constitutes an excellent field for the Botanist as well as Entomologist, and was a favourite resort of my predecessors, Spix and Von Martius, to whom it yielded a rich harvest of both plants and insects.

"On the 24th of October, a party consisting of Mrs. Miers, her sister, Miss Place, and young Mr. Miers and myself, set out on an excursion along the whole length of the aqueduct. From my journal I proceed to extract the notes which I took immediately on our return:—'After reaching the head of the Sarangeiras Valley, about two

miles from the place whence we started, the ascent becomes rather steep, so that the ladies were obliged to proceed on foot. At this time it was about 9 A. M., and the rays of the sun, proceeding from a cloudless sky, were very powerful; but a short distance brought us under the cool shade of the dense forest which skirts the sides of the Corcovado, and through which the road passes. During the early part of our walk, we observed several large trees of a thorny-stemmed *Bombax*, growing by the side of a rivulet in the Sarangeiras Valley. Further on were some shrubby *Violaceæ*, with small white flowers, and we also picked a few insects, principally *Coleopteræ*, from the leaves of some small bushes by the road-side. A considerable way further up, on the banks of a small stream that descends from the mountain, we found two species of *Dorstenia* that I had not previously seen, one of them the *D. ceratosanthus* of Loddiges, the other had a similar kind of branched receptacle, while its entire foliage resembles that of *D. arifolia*. Near this spot we added to our collection fine specimens of the beautiful *Tree-Fern* (*Trichopteris excelsa*), which grew in great abundance under the shade of lofty forest-trees; while herbaceous *Ferns* are numerous by the side of the stream. The forests here exhibited all the characteristics of tropical vegetation. The rich black soil which has been forming for centuries from the decay of leaves, &c. is covered with *Ferns*, and many species of *Dorstenia*, *Heleconia*, and *Bignonia*, together with other herbaceous plants; while above these again, wave the graceful Tree Ferns, and the noble Palms, their fronds trembling in the slightest breeze, bow as if to greet the stranger who passes beneath their shadow. But it is the large forest-trees themselves which produce the strongest impression on the mind of a native of the Old World. Their thickness, and the great height to which they rear their unbranched stems first claim his attention. Then, in place of the few *Mosses* and *Lichens* that cover the trunk and boughs of his own country's woods, here they are bearded from their roots to the very tips of the smallest branches, with *Ferns*, *Aroideæ*, *Tillandsiæ*, *Cacti*, *Orchideæ*, and many other epiphytous and parasitical plants. Besides these, the trunks of many are encircled with the twining stems of climbing *Bignonias*, and other plants of similar habit, the branches of which frequently become thick, and compress the tree so much, that it perishes in the too close embrace. Those climbers, again, which merely ascend the trunk, supporting themselves by their numerous small roots often become detached after reaching the boughs, and the whole mass then presents the aspect of a ship's mast, supported by its stays. These rope-like twiners and creeping plants, passing from tree to tree, descending from the branches to the ground, and ascending again to other boughs, intermingle themselves in a thousand ways, and render a passage through some parts of the woods both difficult and annoying.

"Having reached, by mid-day, the level on which the water from the aqueduct is brought from the Pinheiras, we continued our walk along it for upwards of two miles. Our progress, however, was slow from the number of new objects continually claiming our attention. In damp shady spots by the side of the aqueduct, grew *Nasturtium officinale*, and on the rocks *Marchantia polymorpha*, *Funaria hygrometrica*, *Polytrichum juniperinum*, and *Antheceros punctata*, which being old acquaintances, recalled many pleasing thoughts of home. Several species of *Bignonia* grow on the faces of the moist, sheltered rocks; one species, having white flowers, and leaves as large as those of *Petasites vulgaris*, vegetating on a damp acclivity, together with a large *Heliconia*, proved a striking object. The stems of some were ten feet high; *B. argyrostigma* was the most common kind. I saw *Cactus truncatus* for the first time in its wild state, on the face of a bare dry rock, but it was not in blossom. While gathering *Polytrichum juniperinum*, I had a narrow escape from a large and poisonous snake; I caught it in my hand along with the tuft of the

moss, which was presently dropped when I perceived what accompanied it. As the creature did not attempt to make off on being released, I managed to secure and bring it home. Near the termination of the aqueduct, we collected specimens of a shell belonging to the genus *Valvata*, and some curious Insects.

"About 7 P. M. we regained the spot where we had left the blacks, our horses, and the materials for dinner; and by the time we had partaken of this meal, darkness had already set in. As the road is by no means of easy descent, even by day, we should not have thought of staying so long, if we had not been certain of moonlight, and therefore delayed for half an hour longer till the time of its rising. During this period, we had a good opportunity of listening to the sounds produced by the various animals which are in a state of activity at this particular hour. Pre-eminent above all the rest, is that emitted by the *Blacksmith Frog;* every sound which he produces ringing in the ears like the clang of a hammer upon the anvil; while the tones uttered by his congeners strikingly resemble the lowing of cattle at a distance. Besides these, the hooting of an owl, the shrill song of the *Cicada*, and the chirping of grasshoppers, formed a continual concert of inharmonious tones.

The moon having now risen, we continued our journey; but the lowering clouds, together with the shadows of the overhanging forest-trees, prevented our deriving much advantage from its light, and as soon as we could gain a glimpse of the horizon, every thing betokened an approaching storm. To the North lay a mass of the blackest clouds, whence streamed from time to time, vivid sheets of most brilliant lightning. This continued till we reached home, which we did shortly after 10 P. M., and had reason to deem ourselves highly fortunate, for we were scarcely seated when the tempest burst forth in all its fury, accompanied with a deluge of rain."

"The longest excursion I have made during my stay here, was to the Tejuca Mountains, whither I was accompanied by Mr. J. Miers, jun., and where we remained ten days. Instead of the direct road from Rio, we preferred taking the worse and more circuitous one along the shore. We started on the 19th of November, and on our way, found growing among shrubs by the sea-side, a species of *Tropæolum* (*T. aduncum?* Sm.), and on dry bushy banks great plenty of the *Gloxinia speciosa*, in full beauty. This species I had previously seen, growing by thousands on the face of a dry hill near the head of the valley of Rio Camprido. Close to the shore, and about fifteen miles from the city, rises the Gavea, a flat-topped mountain, two thousand feet above the level of the sea, to which it presents a nearly perpendicular precipitous front. Expecting to find some *Orchideous plants* on this mountain, we paid it a visit, and in the way picked up some shells belonging to the genera *Helix* and *Bulimus*. Between the cleared ground, attached to a Fazienda at the mountain's foot and the mountain itself, lies a belt of native wood, passing through which we found a few plants of *Dichorisandra thyrsiflora* and a few *Ferns* we had never previously seen. On reaching the face of the mountain, we found its base covered with various species of *Bromelia, Tillandsia, Begonia*, and *Cactus*, with other plants which affect such situations. At an elevation of several hundred feet above us, we observed several clusters of a beautiful Orchideous plant in full blossom; from its inaccessible situation, we were unable to reach it, but found the same some days after on a neighbouring mountain, and ascertained it to be *Cattleya labiata*. Continuing our journey, we passed some large plants of *Cleome arborea*, loaded with their large purple flowers, abundance of the *Tropæolum* before noticed, *Dichorisandra thyrsiflora*, and another species of the same genus. Along the side of the path were several trees of *Rollinia longifolia*, while the underwood was reddened with the crimson bracteas of a *Heliconia*. The road, after winding round the Gavea, terminates at a salt-water lake, which passengers who follow this route are obliged

to cross. Here we found a few specimens of a kind of *Alstrœmeria*, with a long twining stem, and then embarked in a rotten leaky canoe, to pass over the lake. The path which led to the house where we meant to take up our residence, lay for about two miles through a flat meadow-land, partly in its original state and partly planted with *Indian Corn* and *Bananas*, &c. During our walk, we observed a migratory body of small black ants. The immense number of individuals that composed it may be imagined from the fact, that the column was about six feet broad, and extended in length to upwards of thirty yards, the ground being so completely covered with these little creatures, that the point of a pin could scarcely be put down without touching one. By dusk we reached the house, which is situated in a coffee plantation, called the Cruz, belonging to a Brazilian marquis, but of which the soil is too much worn out to answer the cost of culture. For the last five years the place has been rented by a party of English merchants, who resort thither during holidays, and by the kindness of one of these, J. Dickenson, Esq., we were allowed to remain in it as long as we might choose.

Next morning, after arranging the plants gathered the preceding day, we took a walk in the vicinity of our new quarters, and in a wood behind the house, collected specimens of an arborescent *Solanum*, with small white flowers, and resembling one of the *Melastomaceæ*. The soil, which during the more prosperous days of the estate had been under cultivation, was over-run with *Pteris aquilina*, a rank coarse Fern, quite like our own *P. aquilina*, of which it is perhaps only a variety. By the side of a small stream that descends from a hill close by, we gathered a few specimens of an Irideous plant, with small yellow flowers, and some also of *Besleria lutea*. On our return we found, in a small stream that traverses a little meadow, a species of *Herpestes*, with nearly round leaves and light blue flowers. Darkness now obliged us to return, but having revisited the spot next morning, we gathered a small *Sisyrinchium*, and, on a dry bank, *Anagallis cærulea* was growing in great plenty. This plant I have met with in three or four places, and feel no doubt of its being a native of Brazil. We likewise collected specimens of a *Plantago* and *Silene*. On our return to the Cruz we passed a small orchard of *Apples*, the only one I have seen in this country. The vicinity of Rio is much too warm for this fruit, while Tegnea, lying at a considerable elevation, possesses a much cooler atmosphere, and produces, besides *Apples*, excellent *Figs*, *Grapes*, and *Peaches*.

" Early in the forenoon, we set off to ascend the Pedra Bonita, a mountain situated immediately behind the Gavea, and on our way thither visited the Coffee Plantations of Mrs. Mokes and Mr. Lescene, which are considered the two best-managed estates in the Province. From the garden of the former proprietor the *Oncidium Russellianum* was first sent to the Duke of Bedford's gardens at Woburn Abbey; and we looked about to see if any of it remained, but could only find, among the Epiphytous tribes, a few flowerless pseudo-bulbs, growing on the stump of an old tree. By the side of a stream which runs through the valley where these plantations are situated, we noticed an arborescent species of *Urtica*, with a stem eight inches in circumference, and more than fourteen feet high. On a dry bank grew *Dichondra sericea* and *Hydrocotyle Asiatica*, the latter one of the commonest productions of the vicinity of Rio. For a considerable way, our ascending path was bordered with *Orange-Trees*, whose shadow was no less acceptable than their juicy fruit was grateful. Thence, we came to a tract where the native forest having been felled, was replaced by a thick wood of young trees, consisting chiefly of arborescent *Solanums*, *Rollinia longifolia*, &c., while great numbers of *Cecropia peltata* and *palmata* reared their heads above the rest, conspicuous at a greater distance than almost any other tree by their white bark, their branches growing at right angles to the trunks, and their large-lobed leaves, whose snowy

under surface, when agitated by the wind, gives the whole tree the appearance of being clothed with white flowers.

"Near the summit of the Pedra Bonita there is a Fazienda or farm, the proprietor of which is now clearing away the virgin forest, which reaches to the very summit of the mountain, and converting the wood of the larger trees into charcoal. We considered ourselves fortunate in having made our visit just at this time, when several massy trunks had been felled from which we obtained a rich harvest of Orchideous plants with little trouble. Several of the larger denizens of the forest I found to belong to the Natural Orders *Melastomaceæ* and *Myrtaceæ*, but what the others were I could not determine.

"The ascent to the Pedra is made on the North side, which is the only part still covered with wood. Immediately on emerging from the forest, and attaining the summit, a most magnificent view of the surrounding country presents itself. As it was nearly sunset before we attained the top, there was little time for botanizing. On the edge of a precipice on the eastern side, we found a large patch of *Cattleya labiata*, which, with some difficulty, and no small risk, I managed to reach, and obtained both flowering specimens and living bulbs of this beautiful *Epiphyte*. A great part of the mountain-top is covered with *Vellosia candida*, on the branches of which we saw two parasitical *Orchideæ*, and, growing with the *Vellosia*, two species of a genus belonging to *Apocyneæ*, both of them shrubby, with tuberous roots and large infundibuliform flowers, in one white, in the other purple, but equally exhaling an odour similar to that of the common *Primrose*. In a marshy spot we collected specimens of a *Utricularia* with purple blossoms and long spathulate leaves.

"For the next two days it rained so excessively, that we were reluctantly constrained to remain within doors. As we were resolved to visit the Pedra again, we set off for it on the morning of the 25th of November, in the midst of the heavy rain. The soil in the neighbourhood of Tejuca is a red clay, peculiarly tenacious of moisture, a fact of which we were made abundantly aware during our walk. Many *Mosses* and *Lichens* presented themselves on the rocks by the road-side; and about half way up we observed a small tree of *Mayna Brasiliensis*, sparingly in flower, the inflorescence, however, all staminiferous. Near the Fazienda at the top of the Pedra grew a small plant of the Natural Order *Calycereæ*. (?) Having reached the summit, we paid another visit to the recently-felled trees, and added considerably to our stock of parasites. On the small branches of a *Melastomaceous* tree, grew a few plants of a *Masdevallia*, two of which only were in flower: it is not described in Lindley's *Orchideæ*. We found on several large trees the purple-flowered *Apocynous* plant which we had remarked on our previous visit, growing along with *Vellosia candida*, and also a few tubers of a *Gesnera*, perhaps *G. Douglasii* (vid. No. 251 of collection). Again, I made many endeavours, when at the very summit, to reach the *Cattleya labiata*, but the wetness of the rocks, the strong breeze that was blowing, and the hazy state of the atmosphere, by which the whole summit of the Pedra was wrapped in clouds, baffled all my endeavours, till, with a very long stick, to the end of which a hook was attached, I contrived to possess myself of the whole mass. And now having collected as much as we were able to carry, we began our downward progress, drenched to the skin, and having, on our return to the house, changed our wet clothes, we fortunately experienced no ill effects from our excursion. The heavy rain which continued to fall the next morning, was very unfavourable to our wishes, as alike preventing us from leaving the dwelling and from properly drying the paper in which we wanted to shift our plants. Sunshine, however, ushering in the next morning, we gladly availed ourselves of it, to spread our papers on the terrace at the end of the house, where the powerful rays of a mid-day sun presently evaporated all the moisture, and enabled us to effect a process, which the wet wea-

ther of several preceding days had delayed. The time which we had allowed ourselves to spend at Tejuca having now expired, we returned to the city along the public road, remarking in its vicinity several large trees of *Guarea grandifolia*, D C., a few of *Araucaria imbricata* (*Colymbium angustifolia*, Raddi), and *Cassia Brasiliana*.

"Although I had frequently botanized at the base and sides of the Corcovado, it was not till three weeks ago that I reached its summit, the ascent of which is from the N. W. side, leading through a wood that reaches nearly to the top. The eastern side of this mountain is a nearly perpendicular precipice. Some of the trees, during the early part of the ascent, are very large and attain a great height. The underwood consists of *Palms*, *Melastomaceæ*, *Myrtaceæ*, *Tree-Ferns*, *Crotons*, *Rubiaceæ*, &c. The herbaceous portion of the vegetation is made up of *Ferns*, *Dorstenias*, *Heliconias*, and, in the more open places, of a few large *Grasses*. Towards the summit, the trees become fewer and of a more stunted growth; and shrubs, especially those of the genus *Croton*, are abundant, intermingled with a profusion of *Bamboos* and large herbaceous Grasses. Two shrubs principally occupy the top; these are a *Melastomaceous* one and the *Francisia Hopeana;* the latter, which I had never previously seen in a wild state, surprised me, as I should little have expected to meet with it in such abundance at the summit of a mountain nearly two thousand feet above the level of the sea. It was sparingly in flower. In the clefts of the rocks were a few small *Orchideous plants*, and *Gesnera bulbosa*, of Ker, in great profusion. The bare top of the mountain, consisting of granite of very course formation, is, in many places, covered with small *lichens;* while in the shaded spots I noticed a few patches of *Polytrichum juniperinum.* On the edges of the rock overhanging the eastern precipitous side, grew the white-blossomed *Apocynous* plant that had struck me on the Pedra Bonita, which is a mountain of about equal height with the Corcovado.

"As to what regards the large forest-trees in this neighbourhood, I am sorry to say, that I have learned but little. Indeed this is one of the most difficult departments of Brazilian Botany. To ascertain all that ought to be known on this subject, a person would need to reside for years, instead of months, in the neighbourhood; being possessed, too, of 'all appliances and means to boot,' for the prosecution of his researches. The large trees are not often seen in flower, and when they are in this state, the blossoms are frequently out of reach, even from the loftiest part of their trunks. Almost all that I know on the subject has been derived from the examination of such shed-flowers as lay beneath; and in this way I have ascertained that some belong to the *Melastomaceæ*, others to the genera *Bombax*, *Cassia*, *Lecythis*, *Bignonia*, and *Swartzia*. I have met with two species of *Ficus;* one on the Corcovado, and the other in the Valley of Rio Comprido, but both of them were small trees. As yet I have seen no *Laurus*. You may rest asssured that, during my future travels, I shall always strive to ascertain what the large forest-trees of this country actually are.

"GEORGE GARDNER."

The result of Mr. Gardner's journey to the Organ Mountains may be very shortly expected; and it is then proposed, that he should proceed to a less explored district in *extra-tropical* South America. Buenos Ayres will, probably, be his head-quarters for some time, whence, by means of the Rio Plata, the Uraguay, &c., there is a ready communication with various countries to the west and north-west, and whence a journey to the eastern declivity of the Cordilleras of Chili will, perhaps, be as productive as any portion of South America. It is there that many *Cacteæ* and other rarities were found by Dr. Gillies, which are known to very few Botanists, save to the immediate friends of that lamented Naturalist.

NOTES UPON SOME GENERA AND SPECIES OF AMERICAN ORCHIDACEÆ.

By JOHN LINDLEY, Ph. D. F.R.S.

PART I.

STELIS. *Gen. et Sp. Orch. p.* 11.

So many additions have been made to this genus, that a fresh enumeration of the species has become indispensible. I know of no character well suited to break the species into groups; they are therefore simply divided into those with secund, and those with equally distributed flowers.

§ 1. *Flores secundi.*

1. S. ophioglossoides. *Swz.*
2. S. disticha. *Pöppig. t.* 81.
3. S. connata. *Presl.*
4. S. spathulata. *Pöppig. t.* 80.
5. S. *lamellata;* folio obovato-lineari basi angustato petiolato mucronato caule longiore racemis multifloris duplò breviore, floribus secundis, sepalis ovatis æqualibus obtusiusculis, petalis minimis truncatis, labello subrotundo apiculato utrinque basi lamellato.—Ravines of Pichincha. *Jameson;* at the height of twelve thousand feet, *Hall. Hook. Ic. Pl. t.* 62.
6. S. pusilla. *Kth.*

§ 2. *Flores quaquaversi.*

7. S. *ascendens;* folio oblongo carnoso brevè petiolato caule longiore, rhizomate membranaceo-vaginato, racemo quaquaverso laxo folio duplò longiore, floribus globosis semitrifidis, petalis membranaceis orbiculatis, labello conformi acuto.—On trees in the valley of Lloa, at the elevation of eight thousand feet. *Hall.*
8. S. *ciliaris;* folio coriaceo oblongo emarginato basi acuminato caule longiore, racemo nutante caudato folio subæquali, sepalis oblongis ciliatis, petalis subrhombeis labelloque oblongo rotundatis carnosis.—Flowers deep purple. Mexico. *Hartweg.*
9. S. Jamesoni. *Lindl.*
10. S. Hallii. *Lindl.*
11. S. *grandiflora;* folio oblongo emarginato cauli æquali, racemo distícho multifloro folii longitudine, sepalis æqualibus obtusis, petalis nanis ovatis, labello ovato concavo obtuso[1] emarginato. — Brazil. *Descourtilz.*
12. S. *cæspitosa;* acaulis, folio ovali obtuso, racemis quaquaversis folio duplò longioribus, sepalis obtusis, petalis nanis conformibus, labello ovato petalis simillimo.
13. S. concinna. *Lindl.*
14. S. *aprica;* multicaulis, foliis lineari-spathulatis obtusis racemis capillaribus solitariis æqualibus, floribus minutissimis, petalis transversis rotundatis, labello minore carnoso trilobo: lobis lateralibus minoribus obtusis.—Brazil. *Martius, Hindes.*
15. S. intermedia. *Pöppig. t.* 79.
16. S. micrantha. *Swz.*
17. S. *elatior;* folio oblongo obtuso coriaceo caule racemoque quaquaverso nutante duplò breviore, sepalis patentissimis ovatis æqualibus, petalis minimis truncatis, labello carnoso oblongo obtuso petalis parùm majore.—Peru. *Mathews,* 1914.
18. S. *truncata;* folio oblongo-lanceolato acuto coriaceo basi angustato racemo erecto multo longiore, caule ramoso vaginato, bracteis acuminatis tortis floribus longioribus, calyce bipartito lobo altero latiore emarginato, petalis rotundatis, labello truncato.—Peru, Province of Chacapoyas, *Mathews.*
19. S. *capillaris;* folio lineari obtuso membranaceo caule multo longiore rarò emarginato, racemis capillaribus folio paulo longioribus, floribus minutissimis, petalis nanis truncatis, labello subrhomboideo acuto.—Peru. *Mathews,* No. 1909.—Very near S. intermedia. *Pöppig,* from which its shorter racemes and very different lip distinguish it.
20. S. *Catharinensis;* folio coriaceo lineari-spathulato mucronato in petiolum angustato caule longiore, racemo nutante folio longiore, floribus minutissimis, petalis truncatis membranaceis, labello tridentato laciniis lateralibus obsoletis intermediâ acuta.—St. Catharine's. *Tweedie;* near Rio Janeiro. *Martius.*

[1] β. Tweediana; labello ovato rotundato integerrimo, sepalis cordatis, floribus triplò minoribus.—St. Catharine's. *Tweedie.*—An sp. distincta?

OCTOMERIA. *Gen. et Sp. Orch. p.* 10.

O. *pusilla;* folio lineari-oblongo, floribus 3—4, labello ovato-obtuso basi bilamellato, sepalis petalisque lineari-lanceolatis.—St. Catharine's, Brazil, *Tweedie.*—Caulis et folium simul sumpta vix palmaria.

O. *crassifolia;* folio lineari-oblongo crassissimo plano, floribus 6—9, labello ovato convexo serrulato acuto basi obscurè bilamellato, sepalis petalisque lineari-lanceolatis.—Rio Janeiro, *Loddiges.*—Leaves three to four inches long. Flowers pale yellow. Lip with a very small double purple spot.

O. *Loddigesii;* folio lineari-lanceolato subemarginato canaliculato, floribus 4—6, labello membranaceo oblongo denticulato convexo apice truncato apiculato basi contracto rotundato lamellis carnosis conspicuis.—O. graminifolia. *Lodd. Bot. Cab. t.* 1891, not *Hooker.*—Lip with a single purple spot in the middle.

PLEUROTHALLIS. *Gen. et Sp. Orch. p.* 4.

§ 1. *Acaules. Flores aggregati, v. solitarii.*

P. *tentaculata* (Restrepia tentaculata. *Pöppig, t.* 59.)—I do not perceive in what respect this plant differs from *Pleurothallis,* with which it corresponds in habit, in the adhesion of its lateral sepals, and in having only two pollen-masses; the latter is the only point in which *Restrepia* appears to me really to differ from *Pleurothallis.* To be stationed next. *P. grandiflora.*

P. multicaulis, *Pöppig, t.* 82, is certainly P. succosa, *G. et Sp. Orch. p.* 5.

P. *scabrilinguis;* folio cordato-lanceolato apice tridentato caule duplò longiore, floribus subsolitariis, sepalis ovatis convexis subæqualibus lateralibus omninò connatis, petalis brevioribus lineari-subulatis serrulatis, labello unguiculato oblongo sagittato piloso venâ intermediâ apice varicosâ.—Peru, *Mathews,* No. 1904. Next *P. cordata.*

P. undulata, *Pöppig, p.* 48.—Cuchero, *Mathews,* No. 1906. Mathews's specimens from Cuchero agree very well with the description in Pöppig, but not with the definition which is at variance with the description in what concerns the labellum.

P. *Pöppigii* (Myoxanthus monophyllus, *Pöppig, t.* 88); folio lanceolato emarginato, sepalis setaceo-acuminatis lateralibus basi connatis, petalis conformibus, labello lineari-lanceolato obtuso pedi producto columnæ adnato, ovario pubescente.—Myoxanthus differs from Pleurothallis in nothing except the lengthened base of the column; but this is variable in degree throughout the most genuine species of Pleurothallis, and in P. succosa, Mathewsii, petiolaris, &c. exists as strongly as in Myoxanthus, thus breaking down the technical, although not the natural distinction between my sections of Pleurothalleæ and Dendrobieæ in the Malaxideous tribe.

P. *affinis;* folio lanceolato tridentato, sepalis setaceo-acuminatis liberis, petalis conformibus, labello ovato-oblongo obtuso pedi producto columnæ adnato, ovario pubescente.—Peru, *Mathews,* No. 1899.—Very near the last, from which it appears, from the plate in Pöppig's work, to differ in having smaller flowers, with the lateral sepals quite distinct to the very base, and with the labellum of another figure.

P. *octomerioides;* folio oblongo-lanceolato subemarginato caule (pedali) duplo breviore, floribus fasciculatis, sepalis liberis carnosis obtusis, petalis æquilongis lineari-lanceolatis carnosis obtusis, labello minimo ovato canaliculato integerrimo glabro.—Mexico, *Henchman.*—A tall species, very much like an Octomeria. I am acquainted with it through specimens sent me by J. Willmore, Esq., of Oldford.

§ 2. *Acaules cæspitosæ.*

P. tricarinata. *Pöppig, t.* 87.

P. *fusca;* folio obovato-lanceolato caule longiore, racemo solitario laxo paucifloro folio longiore, sepalis 2 oblongis acutis inæqualibus, labello obovato-lanceolato acuto plano, clinandrio subcucullato denticulato.—Brazil. *Descourtilz.*—Flores fusco-purpurei intus lutei maculati. Next P. Grobyi.

P. flexuosa—Specklinia flexuosa, *Pöppig, t.* 90. Next the last.

P. *uniflora ;* folio lineari-lanceolato subsessili, pedunculo unifloro folii longitudine, sepalis oblongo-lanceolatis acutis subæqualibus inferiore emarginato, labello lineari-lanceolato obtuso basi concavo.—Brazil, *Descourtilz.* Next P. hymenantha.

P. *glanduligera ;* folio ovali carnoso tridentato racemis brevibus 2—3-floris fasciculatis triplo longiore, calycis bilabiati sepalis carnosis basi connatis lateralibus agglutinatis supremo oblongo brevioribus, petalis lanceolatis serratis, labello ovato unguiculato obtuso apice piloso basi utrinque auriculato: auriculis minimis triglandulosis.—Rio Janeiro, *Loddiges.* —Flowers pale yellowish green, faintly streaked with dull purple.

P. *parvifolia ;* folio minimo ovali acuto emarginato subsessili, pedunculo solitario folio longiore, sepalis oblongis acutis inferiore emarginato majore, petalis nanis obovatis, labello oblongo obtuso apice maculato.—Brazil, *Descourtilz.*

P. *glumacea ;* folio lanceolato petiolo longiore, spicâ nutante multiflorâ foliis 3-plò longiore, sepalis linearibus acuminatis subæqualibus inferiore bicarinato, petalis oblongis, labello ovato concavo obtuso.—Brazil, *Descourtilz.*—Flores flavescentes. Next P. racemiflora.

P. *punctata.* I first described this plant from a specimen that flowered in a stove, and which was imperfect. I now learn from the valuable drawings of M. Descourtilz that its flowers are racemose, and that consequently it must be referred to the macropodal division of the genus.

P. *oblongifolia ;* folio oblongo obtuso carnoso racemo erecto laxo duplò breviore, sepalis acuminatis lateralibus connatis, petalis truncatis triveniis, labello angusto glabro apice carnoso contractiore. —Jamaica, *Loddiges.*—Resembles P. racemiflora, near which it may be placed. Flowers red. Fruit narrow, obovate, six-ribbed, very smooth. Bracts cucullate, acute.

P. ciliata (*Knowles* and *Westcott, Floral Cabinet, t.* 19), folio oblongo-lanceolato emarginato coriaceo caule longiore, racemo nutante multifloro folio breviore, sepalis lineari-lanceolatis acutissimis ciliolatis lateralibus semiconnatis, petalis conformibus multò minoribus longè ciliatis, labello linguiformi obtuso concavo subciliato.—Demerara.

§ 3. *Acaules ; macropodæ.*

P. *truncata ;* folio ovato-lanceolato acuminato racemis geminis æquali, caule pluries longiore, sepalis lateralibus in unum ovatum connatis superiore cucullato duplò minoribus, petalis lineari-oblongis, labello truncato involuto.—On trees in woods West side of Pichincha, *Jameson.* Flowers orange-colour.—*Hooker, Ic. Plant. t.* 55.

P. *cauliflora ;* folio subrotundo-ovato petiolato racemis secundis fasciculatis duplò breviore, spathâ oblongâ obtusâ vaginatâ, sepalo inferiore oblongo emarginato superiore ovato obtuso multò minore, petalis linearibus, labello subrotundo membranaceo concavo retuso cum ungue producto columnæ articulato.—On trunks of trees near Lloa, western declivity of Pichincha, *Jameson.*—Hooker, Ic. Plant. t. 50.

P. *pubescens ;* folio lanceolato coriaceo canaliculato racemis brevibus nutantibus fasciculatis duplò longiore, calycis pubescentis sepalo supremo lanceolato lateralibus apice tantùm liberis æquali, petalis lanceolatis serratis, labello oblongo membranaceo glabro acutiusculo lobis lateralibus brevibus rotundatis inflexis, clinandrio serrulato.—Mexico. *Mr. Barker.*—Flowers dull purple, and downy externally; striped with bright purple, and smooth in the inside.

P. *Mathewsii ;* folio oblongo acuminato basi rotundato racemis breviore caule longiore, sepalis petalisque æquilongis setaceo-acuminatis, labello transverso obtusissimo medio carnoso cordato margine dilatato membranaceo.—Peru, *Mathews,* No. 1902.

P. decurrens. *Pöppig, t.* 83. Next P. Mathewsii.

P. floribunda. *Id. t.* 84. Next the last.

P. secunda. *Id. t.* 85. Next P. pulchella.

P. diffusa. *Id. t.* 86. Next the last.

P. *ephemera;* folio oblongo emarginato cauli æquali, pedunculo bifloro folii longitudine, sepalis ovato-lanceolatis acuminatissimis inferiore apice bidentato, petalis obovatis acuminatis, labello linguiformi, ovario triptero.—Brazil, *Descourtilz.*

P. *auriculata;* folio oblongo-lanceolato caule longiore, racemis subgeminis nutantibus paucifloris folio triplò brevioribus, floribus subglobosis, sepalis ovatis concavis æqualibus lateralibus bifidis, petalis ovatis sepalis subæqualibus, labello ovato concavo basi auriculis duabus subulatis clavatis, clinandrio integerrimo.—Brazil, *Descourtilz.*

§ 3. *Caulescentes.*

P. *restrepioides;* foliis oblongis coriaceis obtusis racemis nutantibus multifloris brevioribus, bracteis membranaceis cucullatis apiculatis pedicellis capillaribus brevioribus, calycis membranacei colorati lobis cymbiformibus acuminatis subæqualibus inferiore emarginato, petalis lanceolatis acuminatis sepalis brevioribus, labello angusto lobis lateralibus membranaceis abbreviatis intermedio lineari carnoso recurvo.—Peru, in the Province of Chacapoyas, *Mathews.* — Pollen-masses two. Flowers very large. This, P. secunda and P. grandiflora are exceedingly like Restrepias in general appearance.

Specklinia. *Gen. et Sp. Orch. p.* 8.

Sp. flexuosa, *Pöppig, t.* 90. *Mathews,* No. 1911, is not a genuine species of this genus. It wants the gibbosity of the lateral sepals at the base, and they are, moreover, united. It is rather a Pleurothallis allied to *P. Grobyi.* See that genus. I am not sure that all the Pleurothallides with distinct sepals should not be referred to Specklinia; or perhaps Specklinia itself would be better considered a section of Pleurothallis; so few species have been seen alive, and their flowers are so minute that it is at present, perhaps, impossible to form a correct opinion upon the subject.

Lepanthes. *Gen. et Sp. Orch. p.* 10.

L. *biloba;* vaginis caulis laxis ciliatis, foliis ovato-lanceolatis acuminatis truncatis apiculatis, racemis capillaribus flexuosis foliis æqualibus, petalis apici columnæ adnatis pubescentibus, labello libero cuneato bilobo laciniis acuminatis divaricatis.—Trunks of trees, at an elevation of eight thousand feet, Valley of Lloa, *Col. Hall.*

L. *mucronata;* vaginis caulis glaberrimis aristatis, foliis ovato-lanceolatis acuminatissimis acutè bilobis mucronatis, pedunculis subbifloris folio duplò brevioribus, sepalis æqualibus glumaceis inferiore bilobo, petalis complicatis emarginato-truncatis sagittatis medio longè mucronatis, labelli trilobi columnæ elongatæ semiadnati lobis lateralibus oblongis unguiculo sigmoideo columnam amplexantibus intermedio nano obtuso ciliato.—Trunks of trees, valley of Lloa, at the height of eight thousand feet, *Hall.*—A most curious species, with a highly complicated structure in the flower.

Stenoglossum. *Gen. et Sp. Orch. p.* 62.

The character of this genus was derived from the description and figure in Humboldt and Kunth's Nova Genera et Species Plantarum. A new species in Mr. Mathews' Herbarium shows that the genus does not belong to the division Dendrobieæ in Malaxideæ, but to Pleurothalleæ, in the immediate vicinity of Pleurothallis itself. The lateral sepals are not adherent to the base of the column, except in a slight degree.

St. *subulatum* (*Hooker Ic. Plant. t.* 51); labello petalisque lineari-subulatis, sepalis ovato-lanceolatis triveniis.—On trees near Pichulagua, on the western declivity of Pichincha, *Jameson.*

Restrepia. *Gen. et Sp. Orch. p.* 14.

If this genus is to be separated from Pleurothallis, of which it has all the habit, its distinction must depend upon the number of pollen-masses being four, instead

of two, and the R. tentaculata of Pöppig must be excluded. The following species has altogether the appearance of R. antennifera, from which it differs merely in its lateral sepals being half separate, and in the form and surface of its lip. The character of plicate leaves must be altered to coriaceous; it was derived from the figure in Humboldt and Kunth's work, and does not exist in nature.

R. *guttulata;* sepalis lateralibus semiconnatis supremo tenuissimo aristato multoties majoribus, petalis aristatis sepalis brevioribus, labello lineari emarginato scabro basi mutico.—Woods on the western side of Pichincha, on trunks of trees. *Jameson.*

MASDEVALLIA. *Gen. et Sp. Orch.* 192.

I cannot but think that this genus really belongs to the Malaxideous tribe, and ought to be stationed in the neighbourhood of Physosiphon; but as yet I have had no opportunity of examining its pollen-masses. There are two very distinct new species among Mons. Descourtilz's drawings.

M. *tridentata;* folio obovato-oblongo carnoso subsessili apice tridentato scapi longitudine, floribus ventricosis, sepalis acuminatis supremo tridentato lobo intermedio productiore.—Brazil, *Descourtilz.*—Flowers white, tinged with red internally, and tipped with yellow.

M. *aurantiaca;* folio obovato emarginato scapo tetraquetro breviore, floribus ventricosis sub sepalis lateralibus infractis, sepalis aristato-caudatis patentissimis.—Brazil, *Descourtilz.*—Flowers the largest in the genus, brownish externally, a bright orange yellow in the inside.

CHRYSORHÖE; A NEW GENUS OF CHAMÆLAUCIEÆ.

By JOHN LINDLEY, Ph. D. F.R.S.

In a letter to Mr. Robert Mangles, from a correspondent at Swan River, occurs the following passage:—

"We have a magnificent plant, the genus of which I do not know; it belongs to the tenth class of Linnæus: there are several species of it, but the most magnificent is one with golden-yellow flowers, which are borne in large corymbs, *several feet in diameter,* the calyxes elegantly cut or fringed; the flowers are very fragrant, and have all the property of everlasting flowers."

Along with this communication were received some dried flowers, an examination of which enables me to state, that this most remarkable plant forms a new and exceedingly interesting genus of Chamælaucieæ, to which the name of CHRYSORHÖE may be applied, and of which I would propose the following essential character. The only species I have seen may be called *Chrysorhöe nitens,* and will be known by the brief description given below in lieu of a specific character.

CHRYSORHÖE.

Bracteæ 2, concavæ, deciduæ, florem includentes. *Sepala* 5, in lacinias 7—9, subulatas, plumosas, palmatim partita. *Petala* 5, acuta, concava, serrata. *Stamina* omninò libera; 10 fertilia, quorum 5 petalis opposita, et 10 breviora subulata, extra discum carnosum epigynum concavum inserta; *antheræ* subrotundæ, æstivatione inflexæ, apiculatæ, bivalves, basi gibbis 2 sphæricis pellucidis albis auctæ: *polline* olivaceo. *Ovarium* disco omninò tectum eoque et calycis tubo leviter adhærens, uniloculare, basi convexum, hinc ovula duo gerens ascendentia reflexa, funiculis propriis adhærentia; *stylus* subulatus imberbis; *stigma* simplex. *Fructus* ......

Chrysorhöe nitens.

Frustula tantùm vidi, quorum ramuli sunt atrovirides, rigidiusculi, tenues, teretes, glabri, hic illic tuberculati, apice et axillâ quâque uniflori. *Folia* filiformia erecta, glabra, rasa, pellucido-punctata. *Pedicelli* filiformes, foliis longiores. *Bracteæ* obovatæ, membranaceæ, siccæ, glabræ, cucullatæ. *Calycis* tubus turbinatus, angulatus, brevis. *Sepala* aurea, patentissima, plumosa, exsucca. *Petala* aurea, ex-

succa, ovata, serrata, staminibus breviora, decidua. *Stamina fertilia* petalis longiora, *sterilia* breviora, subulata, apice glandulosa. *Antheræ* uniloculares, apice tantum polliniferæ, et illic bivalves; *valvulis* basi truncatis, in glandulas 2, diaphanas, albas, connectivi specie junctas prementibus.

The genus must be placed next Verticordia, from which it differs, if *Verticordia Fontanesii* is taken as the type of that genus, in several important circumstances.

Chrysorhöe has its stamens quite distinct to their very base, the fertile are much longer than the sterile ones, and the anthers have the peculiar structure above described; in *Verticordia*, on the contrary, the stamens are completely monadelphous, the fertile are shorter than the sterile ones, and the anthers open by two oblique lateral clefts in the face of a fleshy spherical connective, altogether destitute of the two conspicuous pellucid glands of *Chrysorhöe.*

The pistil exhibits other well-marked distinctions. In *Chrysorhöe* the ovary is absolutely one-celled, without a trace of a dissepiment, and one pair of ovules rises from one side of the base of the cavity; the style is beardless. In *Verticordia* the ovary has two chords (diverging from the base of the style, and passing down to the origin of the ovules), which indicate the existence of two carpels in combination; two pairs of ovules rise from opposite sides of the base of the cavity; the style protrudes beyond the flower, and is bearded.

FLORÆ INSULARUM NOVÆ ZELANDIÆ PRECURSOR; OR A SPECIMEN OF THE BOTANY OF THE ISLANDS OF NEW ZEALAND.

By Allan Cunningham, Esq.

(Continued from page 336 of the present Volume.)

PLANTÆ CELLULARES.

ALGÆ.

Hepaticæ.

1. JUNGERMANNIA. *L.*

122. J. *Scolopendra;* caule erecto pinnatim ramoso, ramis deflexis attenuatis, foliis oblongis bifidis segmentis bifidis, calyce laterali foliaceo. *Hook. Musc. Exot. t.* 40. *A. Rich. Fl. Nov. Zel. p.* 39.

123. J. *saccata;* caule procumbente, ramis erectis, foliis ovato-quadratis denticulatis, fructu terminali, calycibus oblongis carnosis pendulis. *Hook. Musc. Exot. t.* 16. *A. Rich. Fl. Nov. Zel. p.* 39. *Spreng. Syst. Veg.* 4. *p.* 230.

124. J. *falcata;* caule subrepente, ramis erectis attenuatis insigniter falcatis, foliis erectis appressis rotundatis denticulatis, calyce laterali ex inferna parte caulis oblongo carnoso basi squamosa, seta longissima. *Hook. Musc. Exot. t.* 89. *Spreng. Syst. Veg.* 4. *p.* 230. *A. Rich. Fl. Nov. Zel. p.* 40.

125. J. *adiantoides;* caule repente, ramis erectis divisis, foliis horizontalibus dimidiato-ovatis denticulatis ciliatis, calyce terminali urceolato, ore compresso fimbriato, seta brevi. *Hook. Musc. Exot. t.* 90. *A. Rich. Fl. Nov. Zel. p.* 40. *Spreng. Syst. Veg.* 4. *p.* 230.—J. annotina. *Menz. MSS.*

126. J. *conjugata;* caule repente, ramis erectis divisis, foliis erectis appressis rotundatis spinuloso-dentatis oppositis atque basi per paria connatis, calyce terminali urceolato ore compresso ciliato spinoso-dentato, seta brevi. *Hook. Musc. Exot. t.* 91. *Spreng. Syst. Veg.* 4. *p.* 230. *A. Rich. Fl. Nov. Zel. p.* 40.

127. J. *ramosissima;* caule erecto oblongato subfastigiatim ramoso, foliis arcte imbricatis ovato-rotundatis spinuloso-dentatis, calyce terminali urceolato ore compresso ciliato spinoso, seta brevi. *Hook. Musc. Exot. t.* 92. *Spreng. Syst. Veg.* 4. *p.* 231. *A. Rich. Fl. Nov. Zel. p.* 40.

128. J. *gigantea;* caule adscendente fastigiatim ramoso, foliis distichis rotundato-quadratis denticulato-ciliatis, calyce terminali oblongo ore dilatato compresso ciliato, seta breviuscula. *Hook. Musc. Exot. t.* 93. *Spreng. Syst. Veg.* 4. *p.* 231. *A. Rich. Fl. Nov. Zel. p.* 41.

129. J. *pinnatifolia;* caule erecto ramoso, foliis dense imbricatis ciliatis conduplicatis, lobis inciso-pinnatis, calyce terminali oblongo quadrifido, segmentis inciso-pinnatifidis ciliatis. *Hook. Musc. Exot. t.* 114. *Spreng. Syst. Veg.* 4. *p.* 227. *A. Rich. Fl. Nov. Zel. p.* 41.

130. J. *Billardieri;* caule erecto dichotome ramoso, foliis arcte imbricatis ovatis spinuloso-denticulatis, stipulis magnis transversim oblongis denticulatis. *Schwaegr.*—*Hook. Musc. Exot. t.* 61. *Spreng. Syst. Veg.* 4. *p.* 222. *A. Rich. Fl. Nov. Zel. p.* 41.

131. J. *sinuosa;* caule elongato erecto

subramoso, foliis distichis horizontalibus oblongis decurrentibus bidentatis margine superiore undulato, stipulis 5-fidis segmentis laciniatis, calyce laterali ex inferiore parte caulis ovato, ore ciliato. *Hook. Musc. Exot. t.* 113. *A. Rich. Fl. Nov. Zel. p.* 42. *Spreng. Syst. Veg.* 4. *p.* 224.

132. J. *coalita;* caule repente vage ramoso, foliis distichis horizontalibus ovato-quadratis apice bidentatis, stipulis iis coadunatis 5—6-dentatis, calyce ex parte inferiore caulis obovato attenuato ore 4-dentato. *Hook. Musc. Exot. t.* 123. *Spreng. Syst. Veg.* 4. *p.* 223. *A. Rich. Fl. Nov. Zel. p.* 42.

133. J. *squarrosa;* caule elongato erecto subsimplici squamoso, foliis densissime imbricatis distichis squarrosis subquadratis undulatis, lobis cuspidatis integerrimis vel unidentatis, stipulis magnis bifidis segmentis ovatis cuspidatis, margine laciniato. *Hook. Musc. Exot. t.* 78. *Spreng. Syst. Veg.* 4. *p.* 224. *A. Rich. Fl. Nov. Zel. p.* 42.

134. J. *nobilis;* caule suberecto flexuoso, foliis arcte bifariam imbricatis horizontalibus, lobis ovatis ciliato-dentatis conduplicatis verticalibus, stipulis rotundatis emarginatis ciliatis, calyce oblongo compresso ore laciniato laciniis ciliato-dentatis. *Hook. Musc. Exot. t.* 11. *Spreng. Syst. Veg.* 4. *p.* 219. *A. Rich. Fl. Nov. Zel. p.* 43.

135. J. *glaucescens;* caule erecto, foliis bifariis horizontalibus pubescentibus lobis conduplicatis ovatis, stipulis quadrifidis, calyce terminali foliaceo. *Hook. Musc. Exot. t.* 39. *Spreng. Syst. Veg. v.* 4. *p.* 220. *A. Rich. Fl. Nov. Zel. p.* 43.

136. J. *lanata;* caule erecto compresso pinnatim ramoso, foliis bifariis horizontalibus, lobis conduplicatis stipulisque ciliato-multifidis, calyce oblongo pubescente. *Hook. Musc. Exot. t.* 116. *Spreng. Syst. Veg.* 4. *p.* 226. *A. Rich. Fl. Nov. Zel. p.* 43.

137. J. *flagellifera;* caule erecto pinnatim ramoso, ramis flagelliformibus, foliis distiche imbricatis conduplicatis, lobis lobulisque ovato-lanceolatis acutis integerrimis, stipulis ovatis acute bifidis basi utrinque dentatis. *Hook. Musc. Exot. t.* 59. *Spreng. Syst. Veg.* 4. *p.* 220. *A. Rich. Fl. Nov. Zel. p.* 43.

138. J. *appendiculata;* caule suberecto, foliis dense bifariam imbricatis horizontalibus, lobis verticalibus ovatis, posterioris apicem versus pinnato-incisis serratis anterioribus serratis posterioris lobi paginæ affixis. *Hook. Musc. Exot. t.* 15. *Spreng. Syst. Veg. t.* 220. *A. Rich. Fl. Nov. Zel. p.* 44.

139. J. *tomentella;* surculo erectiusculo bipinnato, foliis bifariis inæqualiter bilobis, lobis inferioribus minutis, superioribus bipartitis, utrisque apice margineque capillariter multifidis, stipulis subquadratis laciniatis, fructu axillari, calycibus oblongis cylindraceis hirsutis ore aperto. *Hook. Brit. Jung. t.* 36. *A. Rich. Fl. Nov. Zel. p.* 44. *Spreng. Syst. Veg.* 4. *p.* 225.

New Zealand.—1827, *D'Urville.*

140. J. *pulchella;* caule elongato erecto subsimplici; foliis bifariis distichis subquadratis quadrilobis pulcherrime ciliatis, stipulis latis 5—6-lobis ciliatis, calyce terminali oblongo plicato ore ciliato. *Hook. Musc. Exot. t.* 94. *Spreng. Syst. Veg.* 4. *p.* 225. *A. Rich. Fl. Nov. Zel. p.* 45.

141. J. *pendulina;* caule erecto pinnatim ramoso, ramis pendulis flagelliformibus foliis superne imbricatis stipulisque valde concavis rotundatis quadrifidis. *Hook. Musc. Exot. t.* 60. *A. Rich. Fl. Nov. Zel. p.* 45.—*J. cupressina,* Sw. *Spreng. Syst. Veg. v.* 4. *p.* 225.

142. J. *microphylla;* caule erecto pinnatim ramoso, ramis pendulis capillaribus, foliis distantibus oblongo-quadratis stipulisque lato-quadratis, minutis planis quadrifidis. *Hook. Musc. Exot. t.* 80. *Spreng. Syst. Veg.* 4. *p.* 225. *A. Rich. Fl. Nov. Zel. p.* 45.

143. J. *palpebrifolia;* caule repente bipinnatim ramoso, foliis rotundatis ciliato-spinosis, auriculis bifidis, segmento uno claviformi altero bi-trifido, stipulis quadrifidis ciliato-laciniatis, ramorum segmentis duobus claviformibus, calyce axillari folioso foliis ciliatis. *Hook. Musc. Exot. t.* 71. *Spreng. Syst. Veg.* 4. *p.* 218. *A. Rich. Fl. Nov. Zel. p.* 46.

144. J. *clavigera;* caule repente bipinnatim ramoso, foliis rotundatis acutis integerrimis, auriculis bifidis, segmento uno claviformi, altero oblongo planiusculo, stipulis quadrifidis, margine revolutis integerrimis. *Hook. Musc. Exot. t.* 70. *Spr. Syst. Veg.* 4. *p.* 218. *A. Rich. Fl. Zel. p.* 45.

145. J. *Phyllanthus;* stipitata, frondibus ovato-lanceolatis simplicibus nervosis integerrimis, fructu e costa superiore frondis basin versus, calyce duplici, *ext.* nervo squamoso, *int.* oblongo cylindraceo carnoso. *Hook. Musc. Exot. t.* 95. *Spreng. Syst. Veg.* 4. *p.* 233. *A. Rich. Fl. Zel. p.* 45.

146. J. *flabellata;* stipitata, frondibus suborbiculatis palmatis dichotome radiatis nervosis integerrimis, fructu in dichotomiarum axillis, calyce duplici, *ext.* brevi bilabiato, *int.* oblongo-cylindraceo, ore laciniato. *Hook. Musc. Exot. t.* 13. *Spreng. Syst. Veg.* 4. *p.* 233. *A. Rich. Fl. Nov*

Zel. p. 46. *Labill. Nov. Holl.* 2. *p.* 109. *t.* 254. *f.* 1.

147. J. *Hymenophyllum;* stipitata, frondibus palmatis dichotomis nervosis denticulatis, fructu in dichotomiarum axillis, calyce duplici, *ext.* squama exigua dentata, *int.* oblongo-cylindraceo, ore dentato. *Hook. Musc. Exot. t.* 14. *A. Rich. Fl. Nov. Zel. p.* 47.—J. podophylla, *Thunb.* —*Spreng. Syst. Veg.* 4. *p.* 233.

148. J. *eriocaula;* caudice compresso lineari pubescente, frondibus alternis ovatis bipinnatis, pinnis angustis linearibus glabris, nervo crasso, fructu axillari, calyce nullo (?) corolla lineari-oblonga carnosa. *Hook. Musc. Exot. t.* 72. *Spreng. Syst. Veg.* 4. *p.* 233. *A. Rich. Fl. Nov. Zel. p.* 47.

Note.—With the exception of *J. tomentella*, n. 139, the whole of the species of *Jungermannia* above enumerated, were gathered by Mr. Menzies in 1791, at Dusky Bay, on the S. W. coast of the Middle Island (lat. 45¾° S.), which part of New Zealand was visited by Capt. Vancouver, in his voyage round the world. The extreme moisture of the atmosphere of that bay and its vicinity, arising from the constant mists that hang about its shores (whence its name), rendered it abundant in certain descriptions of vegetation, and it was found exceedingly rich in Cryptogamic plants, of which the bulk of Mr. Menzies' collection made there, consisted. A portion of these has been published by Sir W. J. Hooker, in his two very elaborate and splendid works on Exotic Cryptogamic Vegetation. Dusky Bay being backed by precipitous elevated mountains, whose summits are perpetually covered with snow, there doubtless remains much to be discovered of its Cryptogamic vegetation affecting permanent moisture, beyond what Mr. Menzies, during the limited stay of Capt. Vancouver's ship, could possibly observe. No Botanist has since visited these shores, which are remarkable as being the locality of an orchideous Epiphyte and an arborescent *Dicksonia*, doubtless the highest latitude at which *Tree Ferns* and *Epidendrums* exist in the southern hemisphere.

2. ANTHOCEROS. *L.*

149. A. *giganteus;* fronde nervosa lineari-furcata laciniata margine crispa, calyce cylindrico oblique truncato; capsula longissima. *Lehm. Nov. Stirp. Jung.* 4. *p.* 25.

New Zealand (Middle Island), Dusky Bay.—1791, *A. Menzies, Esq.*

Obs. A. *crispo Sw.*, similis sed triplo major, basi angulata dichotoma; margine minus crispata, textura laxior. *Lehm. loc. cit.*

3. MARCHANTIA. *L.*

150. *M. polymorpha.* L.

New Zealand (North Island). At the roots of trees in humid forests, on the banks of the Kana-Kana River, Bay of Islands.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

Note.—M. Achille Richard has inserted in his *Flora of New Zealand, Monoclea Forsteri, Hook. Musc. Exot.* (*Anthoceros univalvis*, G. Forster, MSS. in Herb. Lambert); but on what authority is not stated, nor is any particular locality assigned. It was not observed on New Zealand, in either of the voyages of La Coquille or L'Astrolabe. Sprengel gives New Caledonia as one of its native places of growth in the "Insulæ Australes."

LYCOPODIACEÆ.

1. TMESIPTERIS. *Bernh.*

Capsulæ axillares sessiles didymæ 2-loculares, loculis semibivalvibus.

151. T. *Forsteri;* foliis acuminatis setaceo-mucronatis. *Endl. Prod. Fl. Norf. p.* 6.—T. tannensis. *Bern. in Schrad. Journ.* 1801. *p.* 131. *t.* 2. *f.* 5. *Hook. Bot. Misc.* 2. *p.* 365. non Labill.

New Zealand.—1773, *G. Forster.* East coast, parasitical on *Cynthea dealbata.*—1826, *A. Cunningham.*

2. LYCOPODIUM. *L.*

152. *L. Lessonianum;* caule adscendente plano ramosissimo, ramis erectis confertis, fructiferis elongatis longioribus, foliis brevibus oblongis subtriquetris acutis apice incurvis glaberrimis distichis, in inferiori ramorum parte foliolis multo minoribus acutis appressis, spicis terminalibus ovoideo-oblongis brevibus, squamis quadrifariis acutis lepidotis. *A. Rich. Fl. Nov. Zel. p.* 59.

New Zealand.—1827, *D'Urville.*

Obs. Closely allied to *L. densum*, Labill.; but it is said to be readily distinguished by its more slender habit and shorter oval spikes, the scales of which are quadrifariously disposed.

153. L. *densum. Br. Prod.* 1. *p.* 165. *Hook. Bot. Misc.* 2. *p.* 368. *Lab. Nov. Holl.* 2. *p.* 104. *t.* 251. *f.* 1.

New Zealand (Northern Island), Bay of Islands—1825, *G. Forster (Hooker).* Open fern-lands, Wangaroa.—1826, *Allan Cunningham.*

154. L. *cernuum.* L.—*Hook. Bot. Misc.* 2. *p.* 369. *Spreng. Syst. Veg.* 4. *p.* 15.

New Zealand (Northern Island), humid forests at Wangaroa.—1826, *A. Cunningham.*

155. L. *Flagellaria;* caule dependente longo subfistuloso anguloso dichotomo, foliis linearibus sessilibus decurrentibus acutis glabris, supremis decrescentibus, in ramis fructiferis quadrifariam imbricatis, spicis elongatis gracilibus tetragonis sæpius bifidis. *A. Rich. Fl. Nov. Zel. p.* 60. *Bory, in Duperr. Voy.* 1. *p.* 248. *t.* 26. *Hook. Bot. Misc.* 2. *p.* 370.

New Zealand.—1827, *D'Urville* (Northern Island), Wangaroa, hanging from the trunks of *Metrosideros tomentosa* and other timber trees. *A. Cunningham.*

Obs. L. *acrostachyum* (*Wall. Cat. n.* 117. *Hook. Ic. Fil. t.* 181) has been ascertained to be only a smaller variety of this plant.

156. L. *laterale. Br. Prod.* 1. *p.* 165. *Hook. Bot. Misc.* 2. *p.* 371. *Labill. Sert. Caled. p.* 10. *t.* 15.

New Zealand (Northern Island). In bogs between the Wytangy and Keri-Keri rivers, Bay of Islands.—1834, *R. Cunningham.*

157. L. *Phlegmaria.* L. *Hook. Bot. Misc.* 2. *p.* 373.—L. mirabile. *Willd. Sp. Pl.* 5. *p.* 11.—L. australe, *id. l. c.*—L. myrtifolium. *Forst. Prodr. n.* 485. *Spreng. Syst. Veg.* 4. *p.* 12.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (*Hooker*).

158. L. *volubile. Forst.—Spreng. Syst. Veget.* 4. *p.* 12. *Hook. et Grev. Ic. Fil. t.* 70, *Bot. Misc.* 2. *p.* 380.

New Zealand (Northern Island). In dry woods on the Kana-Kana River, Bay of Islands, &c. *C. Fraser.*—1826, *A. Cunningham.* Wangaroa.—1834, *R. Cunningham.* The *Wiwi-coku* of the natives: with its twining branches the women adorn their heads.

159. L. *D'Urvillæi?* caule erecto canaliculato inferne denudato, ramis alternis laxis, foliis bifariis integerrimis, spicis terminalibus tetragonis. *A. Rich. Fl. Nov. Zel. p.* 60. *Bory in Duperr. Voy. p.* 247. *t.* 25.

New Zealand?—1827, *D'Urville.*

FILICES.

Ophioglosseæ.

1. Botrychium. *Swartz.*

160. B. *australe. Br. Prodr.* 1. *p.* 164. *Hook. Bot. Misc.* 3. *p.* 223. *Spreng. Syst. Veg.* 4. *p.* 23.

New Zealand (Northern Island). In the vicinity of the Waimate and Keri-Keri Rivers. Bay of Islands.—1834, *R. Cunningham.*

Ophioglossum. *L.*

161. O. *coriaceum;* radice fibrosa, spica caulina fronde longiore, fronde ovata acuta coriacea avenia opaca.

New Zealand. This species, which appears to come near O. *ovata, Swartz,* (but wanting the reticulated venation of that species,) which Sir W. J. Hooker views as a mere *var.* of O. *reticulatum,* was found near the village Matauri, opposite the Cavallo Islands off the East coast.—1834, *R. Cunningham.*

162. O. *elongatum* (R. C. MSS.); stipite elongato scapo unciali terminali quater longiore, fronde rhombeo-elliptica obtusiuscula reticulato-venosa ecostata.

New Zealand (Northern Island). In the vicinity of Lake Uru-ru-wena, between the Waimate and Keri-Keri Rivers.—1834, *R. Cunningham.*

Gleicheniеæ.

1. Gleichenia. *Sm.*

163. G. *hecistophylla;* frondibus dichotomis proliferis, ramis pinnatis, pinnis linearibus tenuissimis pinnatifidis supra glaberrimis, lobis suborbiculatis arcte approximatis subtus fornicatis, capsulis binis subpedicellatis, rachibus stipiteque superne squamatis lanuginosis.

New Zealand (Northern Island). In open clay-lands and in swampy grounds on the shores of the Bay of Islands.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

Obs. This species will stand next to G. *microphylla* of Mr. Brown, from which it is to be distinguished by the smaller lobes of the pinnæ, and especially in having uniformly two capsules on the very concave under side of those lobes. The plant is, moreover, of much more slender and rigid growth.

164. G. *flabellata. Br. Prodr.* 1. *p.* 161. *Labill. Sert. Caled. p.* 9. *t.* 12. *Spr. Syst. Veg.* 4. *p.* 47.

Puhætia. Incolis.

New Zealand (Northern Island). In moist shady situations, Wangaroa.—1826, *A. Cunningham;* and in humid woods at the Falls of the Keri-Keri River.—1834, *R. Cunningham.*

165. G. *Hermanni. Br. Prodr.* 1. *p.* 161. *Spreng. Syst. Veg.* 4. *p.* 26. *Hook. et Grev. Ic. Fil. t.* 14. *Gaud. Uran. p.* 301.

—Mertensia dichotoma, *Sw.—Willd. Sp. Pl.*—Polypodium dichotomum. *Forst. Prodr. n.* 450.

New Zealand.—1773, *G. Forster.*

Sponte crescit in montibus aridis Novæ Zelandiæ, Radice super igne torrefacta et lapide vel fuste conquassata vescuntur Novæ Zelandiæ homines, exsugendo partem farinosam dulcescentem. *Forst. Pl. Esc. p.* 75.—On la dit aussi de Java et même de la Nouv. Zelande. *Voy. Coquille.*

Osmundeæ.

1. todea. *Willd.*

166. T. *pellucida;* frondibus bipinnatis membranaceis, pinnulis oblongo-lanceolatis profunde pinnatifidis segmentis linearibus acutis integris vel bifidis, pinnarum rachi subtus hirsuta. *Hook. Bot. Misc.* 3. *p.* 232.—Todea hymonophylloides. *A. Rich. Fl. Nov. Zel. p.* 97. *t.* 16.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* In woods subject to inundation, on the banks of the Kana-Kana River, Bay of Islands.—1826, *A. Cunningham,* and in ravines on the East side of Wangaroa Harbour.—1834, *Mr. R. Cunningham.*

Schizæa.

1. lygodium. *Swartz.*

167. L. *articulatum;* scandens glaberrimum, foliis subpedatis, petiolo multoties dichotomo, foliolis sterilibus oblongo-linearibus basi articulatis, fructiferis subflabellatis, in spicis brevibus abeuntibus. *A. Rich. Fl. Nov. Zel. p.* 96. *t.* 15.

New Zealand. Very generally diffused through the drier forests of the Northern Island, where the natives employ its twining stems, twisted into bands, in securing the flag thatch (*Typha*) to the roof-frames of their houses.—1826, *A. Cunningham.*—1827, *D'Urville.*—1834, *R. Cunningham.*—The *Manghi-manghi* of the inhabitants.

2. schizæa. *Sw.*

168. S. *propinqua;* frondibus indivisis teretiusculis postice sulcatis, appendice pinnata 18—20-juga, involucris ciliato-laceris.

New Zealand (Northern Island). In open fern-grounds between the Keri-Keri and Waimate Missionary Stations, Bay of Islands.—1834, *R. Cunningham.*

Obs. This small plant, with a simple filiform frond, very much resembles *S. fistulosa* of Labillardière, an obscurely known species of Van Diemen's Land; but as far as we can gather from the description and figure that Botanist has given of his plant, it differs from the species here characterized in the number of the pinnæ of the appendage, which does not exceed twelve, the groove also that extends along the whole length of the rounded frond, being on its anterior part.

169. S *bifida. Swartz. Br. Prodr.* 1. *p.* 161. *Spreng. Syst. Veg.* 4. *p.* 30. *A. Rich. Fl. Nov. Zel. p.* 95. *Willd. Sp. Pl.* 5. *p.* 87.

New Zealand. *D'Urville* and *Lesson.*

170. S. *dichotoma. Sw.—Willd. Sp. Pl.* 5. *p.* 87. *Br. Prodr.* 1. *p.* 162. *Hook. et Grev. Ic. Fil. t.* 17.

New Zealand (Northern Island). In the Kaikatea Wood (*Podocarpus*) near the Great Fall of the Keri-Keri River; also near the Waimate Mission Station, growing generally about the roots of the *Dammara* or *Kauri Pine.*—1834, *R. Cunningham.*

Polypodiaceæ. (*Filices veræ.*)

1. grammitis. *Swartz.*

171. G. *scolopendrina;* frondibus lanceolatis acutissimis, stipite usque infra decurrentibus, soris prominentibus crassis. *Bory, in Duperr. Voy. p.* 257. *t.* 30. *f.* 1. *A. Rich. Fl. Nov. Zel. p.* 62.

New Zealand, upon the trunks of living trees.—1827, *D'Urville.*

172. G. *australis. Br. Prodr.* 1. *p.* 146.—G. Billardieri. *Willd.—Spreng. Syst. Veg.* 4. *p.* 41.

New Zealand (Northern Island). On decayed timber in the forests of Wangaroa.—1826, *A. Cunningham.* In damp woods near the Waimate Mission Station, and in the forests of the Hokianga River.—1834, *R. Cunningham.*

Polypodium. *L.*

173. P. *attenuatum. Br. Prodr.* 1. *p.* 146. *Spreng. Syst. Veg.* 4. *p.* 46. *A. Rich. Fl. Nov. Zel. p.* 62.

New Zealand.—1827, *D'Urville.*

174. P. *Billardieri. Br. Prodr.* 1. *p.* 147. *Spreng. Syst. Veg.* 4. *p.* 46. *Endl. Prodr. Fl. Norf. p.* 7.—P. diversifolium. *Willd. Sp. Pl.* 4. *p.* 1453. (*non Br.*)—P. phymatodes. *A. Rich. Fl. Nov. Zel. p.* 66. (*excl. Syn. Forst.*).—P. scandens, *Labill. Nov. Holl.* 2. *p.* 91. *t.* 240. (*excl. Syn. Forsteri*).

New Zealand (Northern Island). Covering rocks and climbing over fallen tim-

ber, in the forests of Wangaroa.—1826, *A. Cunningham.*

175. P. *pustulatum.* *Spreng. Syst. Veg.* 4. *p.* 49. *Forst. Prodr. n.* 436. *Schk. Fil. t.* 10.

New Zealand (Northern Island). Climbing the trunks of the largest trees in the forests of Wangaroa; and frequent in humid woods on the Kana-Kana River, Bay of Islands.—1826, *A. Cunningham.*—1834, *Richard Cunningham.*

Obs. This species, which approaches the preceding plant very closely, and is united to it by M. A. Richard, has altogether more attenuated fronds with shorter segments and remarkably prominent sori.

176. P. *tenellum.* *Br. Prodr.* 1. *p.* 147. *Spreng. Syst. Veg.* 4. *p.* 51. *Endl. Prodr. Fl. Norf. p.* 7. *Schk. Fil. t.* 16.

New Zealand (Northern Island). In the shady forests of Wangaroa, where it climbs the stems of the living trees, covering also the trunks of fallen timber in a state of decay.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

177. P. *grammitidis.* *Br. Prodr.* 1. *p.* 107.—Xiphopteris heterophylla. *Spr. Syst. Veg.* 4. *p.* 44.—Grammitis heterophylla. *Labill. Nov. Holl.* 2. *p.* 90. *t.* 289.

New Zealand (Northern Island). In the humid forests of Wangaroa and Hokianga, on decayed timber.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

2. NIPHOBOLUS. *Kaulf. Blume.*

Sori annulares aut rosacei, conferti vel sparsi, pilis stellatis obducti. *Indusium* nullum. *Blum. Fl. Jav. Fil. p.* 48.

178. N. *rupestris.* *Spreng. Syst. Veg.* 4 *p.* 44. *Hook. et Grev. Ic. Fil. t.* 93.—Polypodium rupestre. *Br. Prodr.* 1. *p.* 146.

New Zealand (Northern Island). Shady woods on the shores of the Bay of Islands. —1834, *R. Cunningham.*

179. N. *bicolor;* fronde lineari-lanceolata obtusa basi in stipitem attenuata, subtus stellulato-tomentosa incana costa prominente, soris subdiscretis. *Hook. et Grev. Ic. Fil. t.* 41. *Kaulf. Enum. Fil. p.* 128.—N. serpens, *Endl. Prodr. Fl. Norf. p.* 48. *excl. Syn. Br.*—Polypodium serpens, *Forst. Prodr. n.* 435.—P. stellatum, *Willd. Sp. Pl.* 5. *p.* 151. *A. Rich. Fl. Nov. Zel. p.* 64. *excl. Syn. Br.*—P. elæagnifolium, *Bory. in Duperr. Voy. p.* 259. *t.* 31. *f.* 1.

New Zealand.—1773, *G. Forster* (N. Island). Frequent on the rocks and limbs of trees in the woods round the Bay of Islands.—1826, *A. Cunningham.* Wangaroa.—1834, *R. Cunningham.*

Obs. I have here followed Sprengel and the authors of the *Icones Filicum* (although with some doubts) in considering this a distinct species from the preceding, with which both Endlicher and A. Richard have united it. The specimens from which Hooker and Greville's figure is taken, were incomplete, as the sterile obovate blunt fronds, with which the plant is furnished, as in the preceding species, are not represented in the *Icones Filicum.*—It is the "*Ota*" of the natives (*D'Urville*).

Whilst on the coasts of New Zealand, in 1827, Capt. D'Urville gathered (in Cook's Strait) specimens of a Fern, with simple, linear, coriaceous fronds, which M. Richard has referred to *Polypod. acrostichoides* (Forst.), the *Niphobolus glaucus* of Kaulfuss. But as the specimens were without fructification, M. Richard has enumerated it in his *Essai* with every expression of doubt. It is here, therefore, no further noticed.

3. LOMARIA. *Willd.* (*Stegania. Br.*)

180. L. *lanceolata.* *Spr. Syst. Veg.* 4. *p.* 62.—Stegania lanceolata, *Br. Prodr.* 1. *p.* 152. *A. Rich. Fl. Nov. Zel. p.* 86. *Endl. Prodr. Fl. Norf. p.* 11.

New Zealand (Northern Island). In low woods, occasionally inundated by the Kana-Kana River, Bay of Islands.—1826, *A. Cunningham.* Falls of the Keri-Keri River.—1834, *R. Cunningham;* and in woods at Astrolabe Harbour, Cook's Strait. —1827, *D'Urville.*

181. L. *discolor.* *Willd. Sp. Pl.* 5. *p.* 293. *Spreng. Syst. Veg.* 4. *p.* 65.—Stegamia discolor. *A. Rich. Fl. Nov. Zel. p.* 87. —Hemionitis discolor. *Schk. Fil. t.* 6 (*in tab. sub nom. H. rufæ*).

New Zealand. Damp woods in the vicinity of the Great Fall of the Keri-Keri River, Bay of Islands.—1826, *A. Cunningham.*

182. L. *procera.* *Spreng. Syst. Veg.* 4. *p.* 65.—Blechnum procerum. *Willd. Sp. Pl.* 5. *p.* 415. *Labill. Nov. Holl.* 2. *p.* 97. *t.* 247.—Stegamia procera, *Br. Prodr.* 1. *p.* 153. *A. Rich. Fl. Nov. Zel. p.* 86. *t.* 13.—var. pinnis fertilibus basi dilatatis foliaceis nudis, sterilibus elongato-lanceolatis attenuatis.

New Zealand.—1773, *G. Forster* (N. Island). Humid shady woods on the shores of the Bay of Islands.—1826, *A. Cunningham.* Wangaroa, &c.—1834, *R. Cunningham.*

183. L. *filiformis;* frondibus pinnatis glabris, pinnis sterilibus lanceolatis serrulatis apice attenuatis basi brevi-petiolatis

truncatis simplicibus vel inæqualiter auriculatis, fertilibus elongato-filiformibus, rachique crinito-ramentaceis, caudice scandente paleaceo-squamato.

New Zealand (Northern Island). Shady woods on the hills around Wangaroa.—1826, *A. Cunningham.*

184. L. *propinqua;* frondibus pinnatis glabris, pinnis sterilium lanceolatis valde attenuatis serrulatis basi cuneato-truncatis curto-petiolatis integris vel inciso-pinnatifidis summis distinctis confluentibusve, rachi crinita, fertilium elongato-linearibus, rachi stupeo-squamata, involucris marginalibus laceris, caudice scandente radicante superne densissime squamoso.

New Zealand (Northern Island). Humid forests at Wangaroa, where it climbs the trunks of the smaller trees.—1834, *R. Cunningham.*

185. L. *Fraseri;* frondibus bipinnatis glabris, primulis lanceolatis profunde pinnatifidis sessilibus basi decurrenti-coadunatis, sterilium segmentis oblongis serrato-repandis integrisve falcatis acutis, terminali elongata, fertilium lineari-oblongis integris obtusiusculis, stipite anguloso infra pinnas inæqualiter alato, basi paleaceo-squamoso, caudice scandente scabro.

New Zealand (Northern Island). In shady woods on the East coast.—1825, *C. Fraser,* as also at Wangaroa and Hokianga, in dense forests.—1834, *R. Cunningham.*

4. ALLANTODIA. *Br.*

186. A. *tenera. Br. Prodr.* 1. *p.* 149. *Spreng. Syst. Veg.* 4. *p.* 95.

New Zealand (Northern Island). Humid woods on the shores of the Bay of Islands.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

5. ASPLENIUM. *L.*

187. A. *falcatum.* Sw.—*Br. Prodr.* 1. *p.* 150. *A. Rich. Fl. Nov. Zel. p.* 73. *Endl. Prodr. Fl. Norf. p.* 9. *Spreng. Syst. Veg.* 4. *p.* 84.

New Zealand (Northern Island). In shady forests, growing on trees, Bay of Islands, and country between Keri-Keri and Wangaroa.—1826, *A. Cunningham.*—1834, *R. Cunningham* (Middle Island). Occasionally parasitical on *Cyathea dealbata* at Astrolabe Harbour—1827, *D'Urville.*—*Rayon-Taya* of the natives. *D'Urville.*

188. A. *polyodon. Forst.*—*Willd. Sp. Pl.* 5. *p.* 324. *Spreng. Syst. Veg.* 4. *p.* 85. *A. Rich. Fl. Nov. Zel. p.* 73.

New Zealand, Middle Island.—1778, *G. Forster.*

189. A. *lucidum. Forst.*—*Spreng. Syst. Veg.* 4. *p.* 83. *Schk. Fil. t.* 72.

New Zealand (Northern Island). In woods along the East coast.—1834, *R. Cunningham.*—*Uru-uru-fenna* of the Aborigines.

190. A. *obliquum. Forst.* — *Spreng. Syst. Veg.* 4. *p.* 83. *Schk. Fil. t.* 71. *A. Rich. Fl. Nov. Holl. p.* 72. (*excl. syn.*)

New Zealand (Northern Island). In dense forests at Wangaroa.—1826, *A. Cunningham.* River Thames. — 1827, *D'Urville.*—*Paretoo* or *Parenoko* of the natives. *D'Urville.*

Obs. A. Richard has united this and the preceding species, which other Botanists have considered as very distinct.

191. A. *obtusatum. Forst.*—*Willd.*—*Spreng. Syst. Veg.* 4. *p.* 83. *Br. Prodr.* 1. *p.* 150.

New Zealand.—1773, *G. Forster.*

192. A. *flabellifolium. Cav.*—*Br. Prodr.* 1. *p.* 150. *Spreng. Syst. Veg.* 4. *p.* 86. *Sw. Fil. p.* 81. *t.* 31. *f.* 2.

New Zealand (Northern Island). On rocks near Keri-Keri Mission Station.—*R. Cunningham.*

193. A. *bulbiferum. Forst.*— *Willd. Sp. Pl.* 5. *p.* 345. *Spreng. Syst. Veget.* 4. *p.* 89. *Schk. Fil. t.* 79. *A. Rich. Fl. Nov. Zel. p.* 75. (*excl. syn. Br.*)

New Zealand (Northern Island). In humid woods on the banks of the Kana-Kana, Bay of Islands.—1826, *A. Cunningham.* (Middle Island) Astrolabe Harbour.—1827, *D'Urville.*

6. CÆNOPTERIS. *Berg.*

194. C. *flaccida. Sw. Fil.* 87. *Spr. Syst. Veg.* 4. *p.* 90. *Schk. Fil. t.* 82.—Asplenium heterophyllum. *A. Rich. Fl. Nov. Zel. p.* 74. (*excl. syn. Br.*)—Darea flaccida. *Willd. Sp. Pl.* 5. *p* 295.

New Zealand (Northern Island). Parasitical on *Puriri* and *Pokutu Kana* (*Metrosideros tomentosa*), Bay of Islands (*A. Rich.*), and Wangaroa.—1826, *A. Cunningham.*—1834, *R. Cunningham* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

7. DOODIA. *Br.*

195. D. *aspera. Br. Prodr.* 1. *p.* 151. *A. Rich. Fl. Nov. Zel. p.* 76. *Spreng. Syst. Veg.* 4. *p.* 94.

New Zealand (Northern Island). Shady woods on the banks of rivers, Bay of Islands.—1826, *A. Cunningham.*—1834, *R. Cunningham. D'Urville.*—*Poukon-poukon; Indig.*

196. D. *caudata. Br. Prodr.* 1. *p.*

151. *A. Rich. Fl. Nov. Zel. p.* 76. *Spr. Syst. Veg* 4. *p.* 95. *Hook. Exot. Fl. t.* 25.

New Zealand; with the preceding.

197. D. *Kunthiana;* frondibus pinnatis, pinnis remotis lineari-lanceolatis acutiusculis mucronato-serrulatis infimis petiolatis basi cordatis, terminali lineari stipiteque elongatis. *Endl. Prodr. Fl. Norf. p.* 11. *Gaudich. in Freyc. Voy. p.* 401. *t.* 14. *Hooker in Beechey, Voy. p.* 74 *et* 107.

New Zealand (Northern Island). In dry woods at the Bay of Islands, &c.—1834, *R. Cunningham.*[1]

8. PTERIS. *L.*

198. P. *rotundifolia. Forst. Willd. Spreng. Syst. Veg.* 4. *p.* 70. *A. Rich. Fl. Nov. Zel. p.* 78.

New Zealand (Northern Island). Dry forests on the banks of the Kana-Kana and Wycady Rivers, Bay of Islands.—1826, *A. Cunningham.* (Middle Island.) —1773, *G. Forster.* Astrolabe Harbour. 1827, *D'Urville.*

Obs. Future Botanists may separate this species from Pteris, it having, as Mr. Brown long ago observed, hardly a true involucrum, and the insertion of the capsules is somewhat different from that of the genuine species of the genus.

199. P. *comans. Forst.—Willd. Sp. Pl.* 5. *p.* 381. *Spreng. Syst. Veg.* 4. *p.* 73. *Endl. Prodr. Fl. Norf. p.* 13. *A. Rich. Fl. Nov. Zel. p.* 79. *Schk. Fil. t.* 92.

New Zealand (Northern Island). In shady dry situations in the neighbourhood of the Mission Station on the Keri-Keri River, Bay of Islands.—1834, *R. Cunningham.*

200. P. *esculenta. Forst. Br. Prodr.* 1. *p.* 154. *Spreng. Syst. Veg.* 4. *p.* 77. *Endl. Prodr. Fl. Norf. p.* 12. *A. Rich. Fl. Nov. Zel. p.* 79. *Labill. Nov. Holl.* 2. *p.* 95. *t.* 244.

New Zealand. *D'Urville.* It appears doubtful whether this plant is a native of the Islands of New Zealand or not; Forster gathered it at Tahiti (Society Islands), where it is called *Narré.*

Achille Richard, having ascertained by a comparison of the specimens, that P. *caudata*, L., figured by Jacquin (*Ic. Rar. t.* 645), is identical with this species, observes, "Malgré la loi, d'ailleurs si respectable, de l'anteriorité, j'ai pensé que l'on pouvoit preférer le nom de *Pteris esculenta,* quoique plus recent, parcequ'il indique l'usage que les misérables habitans de la Nouvelle Hollande et de la Nouvelle Zelande font de la racine ou souche de cette fongère, qui est leur principale nourriture."

201. P. *affinis;* frondibus tripinnatis, foliolis linearibus integris subobtusis infimis basi pinnatifidis, terminali cæteris haud longiori, margine integro nec crenato, indusio membranaceo margine continuo, facie inferiori intra fructificationes glaberrima. *A. Rich. Fl. Nov. Zel. p.* 81.

New Zealand (Northern Island). Margin of woods in the vicinity of Wangaroa. —1826, *A. Cunningham.*—1827, *D'Urville.*

202. P. *macilenta;* frondibus bipinnatis, pinnis alternis aut oppositis longe petiolatis, primulis paucioribus distantibus oblongis pinnatifidis, laciniis integris aut apice inciso-dentatis glabris membranaceis, indusiis membranaceis margine continuis. *A. Rich. Fl. Nov. Zel. p.* 82. *t.* 12.

New Zealand (Northern Island). In dry woods at Wangaroa.—1826, *A. Cunningham;* also in similar situations near Wanai on the East coast.—1834, *R. Cunningham.*

203. P. *Brunoniana;* frondibus tripinnatis membranaceis glaberrimis subtus glaucescentibus, foliolis alternis oppositisque, pinnulis oppositis sessilibus lanceolatis obtusiusculis infimis basi repandis, superioribus confluentibus, terminali-elongato, venis anastomosantibus. *Endl. Fl. Norf. p.* 12.

New Zealand (Northern Island). On the margins of dense forests at Wangaroa. 1826, *A. Cunningham.*

Obs. Closely allied to *P. Vespertilionis* (Labill.), the pinnulæ or segments of the pinnæ are, however, more lanceolate and acutely repand than the species of New South Wales.

204. P. *scaberula;* frondibus coriaceis tripinnatis, laciniis fructiferis elliptico-lanceolatis acutis alternis basi attenuatis distinctis supremis confluentibus et in laciniam angustatam integram aut dentatam desinentibus, fructificationibus continuis, sterilibus acutis dentato-serratis, rachi scabra. *A. Rich. Fl. Nov. Zel. p.* 82. *t.* 11.

New Zealand.—1827, *D'Urville.*

205. P. *tenuis;* frondibus bipinnatis membranaceis, pinnis alternis lanceolatis attenuatis, pinnulis oppositis sessilibus lanceolato-oblongis acutiusculis apice subcrenulatis basi dilatatis decurrentibus, infimis pinnatifidis, rachi stipiteque glaberrimis.

New Zealand (Northern Island). Dry

[1] Another species of this genus, a native of New South Wales, and as yet undescribed, may be here noticed.

D. blechnoides, frondibus pinnatifidis, pinnis lineari-ensiformibus valde attenuatis mucronato-serrulatis basi dilatatis, infimis abbreviatis lanceolatis semi orbiculatisve distinctis, stipite teretiusculo basi scabro.

New South Wales. In dark ravines on the Warrabunba River.—1825, *C. Fraser. A. Cunningham.*

wooded hills on the shores of Wangaroa Harbour.—1826, *A. Cunningham.*

206. P. *microphylla;* frondibus tripinnatis alternis, foliolis lanceolatis attenuatis, pinnulis ovato-oblongis inciso-dentatis basi sursum sæpe lobato-auriculatis infimis pinnatifidis, stipite rachique scabris paleaceis.

New Zealand (Northern Island). In dry woods at Wangaroa.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

9. ADIANTUM. *L.*

207. A. *affine.* *Willd. Sp. Pl.* 5. *p.* 448. *A. Rich. Fl. Nov. Zel. p.* 87. *Endl. Prodr. Fl. Norf. p.* 14. *Schk. Fil. t.* 121.

New Zealand (Northern Island). Dry woods at Wangaroa.—1826, *A. Cunningham.* (Middle Island). Astrolabe Harbour, Tasman's Bay.—1827, *D'Urville.*

208. A. *formosum.* *Br. Prodr.* 1. *p.* 155. *A. Rich. Fl. Nov. Zel. p.* 88.

New Zealand (Northern Island). In damp woods at Wangaroa, on the shores of the Bay of Islands, and at Hokianga.—1826, *A. Cunningham.* (Middle Island.) Astrolabe Harbour.—1827, *D'Urville.*

209. A. *hispidulum.* *Br. Pr.* 1. *p.* 155. *A. Rich. Fl. Nov. Zel p.* 88.—A. pubescens. *Willd. Sp. Pl.* 5. *p.* 439. *Spr. Syst. Veg.* 4. *p.* 112. *A. Rich. Fl. Nov. Zel. p.* 89. *Endl. Prodr. Fl. Norf. p.* 14.

New Zealand (Northern Island). Dry woody hills, Wangaroa.—1826, *A. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

10. CHEILANTHES. *Swartz.*

210. C. *tenuifolia.* *Sw.*—*Br. Prodr.* 1. *p.* 83. *A. Rich. Fl. Nov. Zel. p.* 83. *Spreng. Syst. Veg.* 4. *p.* 117. *Schk. Fil. t.* 125.

New Zealand (Northern Island). Rocks at the Keri-Keri Mission Station, Bay of Islands, &c.—1834, *R. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

211. C. *ambigua;* fronde bipinnata, laciniis oblongis sessilibus subobtusis inciso-dentatis, soris interruptis subrotundis, subtus dentes laciniarum revolutos solitariis nudis, rachi foliolisque pilosis. *A. Rich. Fl. Nov. Zel. p.* 84.

New Zealand (Northern Island). In woods at Wangaroa, and on the shores of the Bay of Islands.—1827, *D'Urville.*—1834, *R. Cunningham.*

11. LINDSÆA. *Dryandr.*

212. L. *Lessoni;* frondibus gracilibus longe petiolatis pinnatis, pinnis distantibus inferioribus subpinnatis, mediis inciso-crenatis superioribus confluentibus, laciniis subtriangulari-flabellatis integris aut crenatis, soris integris aut interruptis, petiolis glabris, stipite repente setoso. *A. Rich. Fl. Nov. Zel. p.* 84. *Bory, in Duperr. Voy. p.* 278. *t.* 37. *f.* 2.

New Zealand (Northern Island). In dry deep woods at Taurangha, Bay of Plenty.—1826, *A. Cunningham.* Bay of Islands.—1827, *D'Urville.* *Pico-Pico* of the natives.

213. L. *linearis.* *Br. Prodr.* 1. *p.* 156. *A. Rich. Fl. Nov. Zel. p.* 85. *Sw. Fil. t.* 3. *f.* 3.

New Zealand. *D'Urville.*

214. L. *trichomanoides.* *Willd. Sp. Pl.* 5. *p.* 425. *A. Rich. Fl. Nov. Zel. p.* 85. *Spreng. Syst. Veg.* 4. *p.* 80. *Schk. Fil. t.* 114.

New Zealand (Middle Island).—1773, *G. Forster.* (Northern Island). In damp woods on the Keri-Keri River, and near the Falls of the Wytangy.—1834, *R. Cunningham.*

12. LOXOMA. *R. Br. MSS. ined.*

GEN. CHAR. *Sori* subintramarginales in sinubus dentium frondis. *Involucrum* textura frondis, suburceolatum. *Receptaculum* filiforme, longe exsertum. *Capsulæ* obovatæ, pedicellatæ, oblique annulatæ, pilis articulatis sæpe clavatis mixtæ. *Semina* triangularia.—Frons *coriacea, bi-tri-pinnatifida, glabra, subtus glauca; laciniis lanceolatis, dentatis, subpinnatifidis; sinubus soriferis.*

215. L. *Cunninghamii.* Br. MSS. ined. (TAB. Nostr. XXI, XXXII).

Davallia dealbata. *A. C. MSS.*, 1826.

Trichomanes cænopteroides. *Harv. MSS. cum fig.*

New Zealand (Northern Island). In humid woods in the vicinity of the Falls of the Keri-Keri River.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

Filix pulcherrima. *Caudex* horizantalis, radicans, crassitie pennæ Cygni, squamulis intense fuscis densissime obsitus. *Stipes* erectus, spithamæus ad pedalem, tereti-compressus, hinc sulcatus, pallide fuscus, nitidus, glaberrimus, basi nigricans, squamulosus. *Frons* coriacea, glabra, subtus glauca, circumscriptione deltoidea, pinnata, (summitate pinnatifida) pinnis pinnatifidis vel bipinnatifidis, laciniis lanceolatis, dentato-pinnatifidis, in sinubus soriferis. *Involucrum* subintramarginale, urceolato-cylindracea, coriacea. *Receptaculum* longe exsertum, filiforme, crassius-

culum, basi nudum. *Capsulæ* (pilis articulatis nunc clavatis immixtæ) obovatæ, rarius ellipticæ, reticulatæ, basi in stipitem brevem attenuatæ, solitariæ vel aggregatæ, oblique annulatæ, annulo lato dense articulato, hinc (externe) longitudinaliter dehiscentes. *Semina* majuscula, triangularia, rufo-fusca, hinc puncto triangulari impressa.

This exceedingly interesting Fern has been admirably illustrated by drawings of Mr. Francis Bauer, which are now before me, and from which I have profited in drawing up the above generic character.

Mr. Smith, too, of the Royal Gardens at Kew, in his notes accompanying Mr. Bauer's drawings, justly observes that the genus is, as it were, intermediate between *Davallia* and *Trichomanes*. From both of which, however, it is abundantly distinct. (*Hooker.*)

TAB. XXXI. *Loxoma Cunninghamii*. Small plant; *nat. size.* Drawn by the Honourable W. H. Harvey.

TAB. XXXII. *Loxoma Cunninghamii*; magnified dissections; drawn by Francis Bauer, Esq. Fig. 1. Under side of a fructified segment of a Frond. 2. Upper view of ditto. 3. Under side of a small portion of the Frond with a sorus. 4. The same seen from above. 5. Portion of a receptacle with Capsules. 6. Section of an Involucre, showing the whole sorus. 7, 8, 9, 10. Capsules. 11. Seeds. 12. Jointed Filaments seen among the Capsules.

13. DICKSONIA. *L'Heritier.*

216. D. *squarrosa;* fronde bipinnata rigida glabra, foliolis adnatis oblongis acutis mucronato-serratis, soris ad apices dentium solitariis, rachi setoso-hispida, caudice arboreo. *Spreng. Syst. Veg.* 4. *p.* 122. *Sw. Syn. Fil.* 136 *et* 355. *Willd. Sp. Pl.* 5. *p.* 485. *Schk. Crypt.* 124 *et* 130. —Trichomanes squarrosum. *Forst. Prod. n.* 479.

New Zealand (Middle Island). Dusky Bay.—1773, *G. Forster.*

14. ASPIDIUM. *Swartz.*

217. A. *pennigerum. Sw. Willd. Sp. Pl.* 5. *p.* 215. *Spreng. Syst. Veget.* 4. *p.* 102. *A. Rich. Fl. Nov. Zel. p.* 67.—Polypodium pennigerum. *Forst. Schk. Fil. p.* 17. *t.* 22.

New Zealand (Northern Island). Woods on the Kana-Kana River, Bay of Islands. —1826, *A. Cunningham.* In dark ravines on the shores of Wangaroa Harbour.—1834, *R. Cunningham. Pihon* of the natives.

218. A. *vestitum. Willd. Sp. Pl.* 5. *p.* 261. *A. Rich. Fl. Nov. Zel. p.* 68. *Spr. Syst. Veg.* 4. *p.* 105. *Schk. Fil. t.* 43.

New Zealand.—1773, *G. Forster.*

219. A. *Serra. Willd. Sp. Pl.* 5. *p.* 240. *Spreng. Syst. Veg.* 4. *p.* 103. *A. Rich. Fl. Nov. Zel. p.* 68. *Schk. Fil. t.* 33.

New Zealand (Middle Island).—1773, *G. Forster.*

220. A. *proliferum. Br. Prodr.* 1. *p.* 147. *Spreng. Syst. Veg.* 4. *p.* 105. *A. Rich. Fl. Nov. Zel. p.* 69.

New Zealand.—1824, *D'Urville* and *Lesson.*

221. A. *hispidulum. Sw. Willd. Sp. Pl.* 5. *p.* 266. *Spreng. Syst. Veg.* 4. *p.* 107. *A. Rich. Fl. Nov. Zel. p.* 69.—A. setosum. *Schk. Fil. t.* 49.

New Zealand (Northern Island). Damp woods on the shore of the Bay of Islands. 1826, *A. Cunningham;* and in humid forests of Kaikatea or Swamp Pine, near Waimate. *R. Cunningham.*

222. A. *velutinum;* frondibus longe petiolatis subtripinnatis pilosis subglandulosis, pinnis inferioribus suboppositis bipinnatis, foliolis subpinnatifidis oblongis acutis sessilibus laciniis subdenticulatis, pinnis mediis pinnatis, superioribus pinnatifidis, rachibus rufo-velutinis. *A. Rich. Nov. Zel. p.* 70.

New Zealand. *D'Urville.*

223. A. *coriaceum. Sw.—Willd. Sp. Pl.* 5. *p.* 268. *Spreng. Syst. Veg.* 4. *p.* 106. *Br. Prodr.* 1. *p.* 148. *Endl. Prodr. Fl. Norf. p.* 8. *A. Rich. Fl. Nov. Zel. p.* 71. *Schk. Fil. t.* 50.

New Zealand (Northern Island). On the edges of woods on the River Thames and Bay of Islands.—1827, *D'Urville.* In ravines on the shores of Wangaroa Harbour.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

NEPHRODIUM. *L.—Ch. Richard in Mich. Fl. Br. Am.*

224. N. *glabellum;* frondibus bipinnatis, pinnis alternis, pinnulis subrhombeo-oblongis inciso-serratis petiolatis, basi sursum sæpe lobatis, inferioribus pinnatifidis lobulis infimis discretis, rachi antice ferrugineo-villosa, stipite fere glaberrima tamen versus basin scabriuscula parce squamosa.

New Zealand (Northern Island). Shady woods, Bay of Islands.—1826, *A. Cunningham;* also in humid places at the heads of the Kana-Kana and Wycaddey Rivers.—1834, *R. Cunningham.*

225. N. *molle. Br. Prodr.* 1. *p.* 149. —Aspidium molle, *Sw.—Spreng. Syst. Veg.* 4. *p.* 101. *Jacq. Ic. t.* 640.—Polypodium nymphale. *Forst. Prodr. n.* 442.

New Zealand.—1773, *G. Forster.*

15. CYATHEA. *Sm.*

226. C. *dealbata. Sw.—Willd. Sp. Pl.* 5. *p.* 495. *Spreng. Syst. Veget.* 4. *p.* 127. *A. Rich. Fl. Nov. Zel. p.* 77. *t.* 10.—*Poghna* Incol. (*D'Urville*).

New Zealand (Northern and Middle Islands). A beautiful Tree-Fern, rising usually ten to fifteen feet in height, in humid woods and rocky shaded ravines, on the shores of the Bay of Islands and elsewhere, frequent.—1773, *G. Forster.*—1826, *A. Cunningham.*—1834, *R. Cunningham.* Astrolabe Harbour, Cook's Strait.—1827, *D'Urville.*

227. C. *medullaris. Sw.—Willd. Sp. Pl.* 5. *p.* 494. *Spreng. Syst. Veget.* 4. *p.* 127. *A. Rich. Fl. Nov. Zel. p.* 78. *Schk. Fil. t.* 133.—Polypodium medullare. *Forst. Prodr. n.* 452.

New Zealand.—1773, *G. Forster.*—*Mamagu,* Incol. *Forst.*

Obs. I. Caudex orgyalis spongiosus, substantia medullari farctus, extrorsum hispidus nigricans e casu stipitum, apice frondibus maximis horizontalibus fere patentibus coronatus.

Obs. II. On this arborescent Fern, Forster has the following remark:—“Hæc filicis species in sylvis Novæ Zelandiæ frequens est, et apud incolas *Mamagu* dicitur; hi radicem et caudicis inferioris medullam tostam comedunt; hujus enim substantiæ mollis et pulposæ sapor quandam similitudinem cum *rapæ* sapore habet et quidem hinc præstat ita ut ad medullam *Saguari arboris* accedat. In medullari substantia hujus *Polypodii* succus glutinosus, rubescens abundat.” *Forst. Pl. Escul. p.* 74.

16. TRICHOMANES. *Linn.*

228. T. *reniforme. Forst.—Willd. Sp. Pl.* 5. *p.* 498. *Spreng. Syst. Veg.* 4. *p.* 128. *A. Rich. Fl. Nov. Zel. p.* 95. *Hook. et Grev. Ic. Fil. t.* 31.

New Zealand (Middle Island).—1773, *G. Forster.* Dusky Bay.—1791, *A. Menzies, Esq.* (Northern Island). In shady moist woods, climbing over rocks and trees.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

229. T. *venosum. Br. Prodr.* 1. *p.* 159. *Spreng. Syst. Veg.* 4. *p.* 129. *Hook. et Grev. Ic. Fil. t.* 78.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.* (Northern Island). Shores of the Bay of Islands, or wet rocks at the Falls of the Keri-Keri River.—1826, *A. Cunningham.*

230. T. *strictum;* fronde lanceolata stricta primata, pinnis lanceolatis subpinnatifidis, laciniis linearibus obtusis laxe reticulatis glabris integerrimis, involucris cyathiformibus, ore aperto truncato integro, rachi marginata, stipite nudo. *A. Rich. Fl. Nov. Zel. p.* 95. *Hook. et Grev. Ic. Fil. t.* 122.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

231. T. *elongatum;* fronde deltoideo-ovata acuta bipinnata, pinnis alternis lanceolatis, pinnulis basi profunde dissectis apice dilatatis inciso-lobatis lobis denticulatis, rachi stipiteque teretibus nudis, involucro oblongo compressiusculo subalato, ore bilabiato, labiis crenulatis, receptaculo elongato involucro multoties longiore.

New Zealand (Northern Island). Dark ravines in the forests of Wangaroa, &c.—1834, *R. Cunningham.*

Obs. Upon this beautiful and hitherto undescribed species, a small *Jungermannia* is occasionally parasitical.

232. T. *leptophyllum;* fronde lanceolata pellucida flaccida bipinnata, pinnis alternis, pinnulis profunde divisis, laciniis linearibus obtusis integerrimis, rachi marginata, involucro oblongo, ore vix labiato.

New Zealand (Northern Island.) Damp woods at Kokianga.—1834, *R. Cunningham.*

Obs. In affinity, this species appears to approach nearest to *T. angustatum* cf Carmichael, figured in Hook. Ic. Fil. t. 169; but it differs in the form of the involucrum, and in having a much longer receptacle than in *T. angustatum,* which is described as being but double the length of the involucrum.

17. HYMENOPHYLLUM. *Smith.*

233. H. *dilatatum. Sw.—Willd. Sp. Pl.* 5. *p.* 533. *Spreng. Syst. Veg.* 4. *p.* 132. *Hook. et Grev. Ic. Fil. t.* 60.

New Zealand (Middle Island).—1791, *A. Menzies, Esq.* (Northern Island). In humid woods on the limbs of decayed trees, Bay of Islands.—1826, *A. Cunningham.*

234. H. *sanguinolentum. Sw.—Willd. Sp. Pl.* 5. *p.* 529. *Spreng. Syst. Veget.* 4. *p.* 132. *A. Rich. Fl. Nov. Zel. p.* 93. *Schk. Fil. t.* 135. *c.*

New Zealand (Middle Island).—1776, *G. Forster.* (Northern Island). Bay of Islands, in damp shady woods.—1826, *A. Cunningham.*

235. H. *scabrum;* stipite ramoso rachique piloso-scabris, frondibus elasticis, lanceolatis pinnatis acutis, pinnis subbipinnatifidis, laciniis linearibus obtusis glabris sæpius apice bifurcatis, indusiis terminali-

bus obtusis denticulatis bivalvibus. *A. Rich. Fl. Nov. Zel. p.* 90. *t.* 14. *f.* 1.

New Zealand (Middle Island). Humid forests on the shores of the Bay of Islands, on the trunks of decayed trees.—1826, *A. Cunningham.*—1827, *D'Urville.*

236. H. *nitens.* *Br. Prodr.* 1. *p.* 159. *Spreng. Syst. Veg.* 4. *p.* 131. *A. Rich. Fl. Nov. Zel. p.* 94. *Hook. et Grev. Ic. Fil. t.* 197.

New Zealand (Middle Island).—1791, *A. Menzies, Esq.* (Northern Island). Bay of Islands, on fallen timber.—1826, *A. Cunningham.*

237. H. *tortuosum,* fronde ovata tripinnatifida, laciniis linearibus obtusis glabris denticulatis marginibus plicatis tortuosis, involucris ovalibus inflatis, ore parvo bilabiato ciliato. *A. Rich. Fl. Nov. Zel. p.* 94. *Hook. et Grev. Ic. Fil. t.* 129.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

238. H. *flexuosum,* fronde ovata subacuminata tripinnatifida glabra, laciniis linearibus retusis apice nunc emarginatis, marginibus integerrimis undulatis, involucris orbiculatis compressis solitariis geminisve, ore bilabiato integro vel emarginato, rachi stipiteque superiore alatis, alis undulatis flexuosis.

New Zealand (Northern Island). In humid forests, on decayed timber, Wangaroa.—1834, *R. Cunningham.*

Obs. This species differs from the preceding, its close ally, in the mouth of the involucre being wide, the lips almost altogether entire; and in the segments of the frond having no denticulations on their waved margins, which are obvious in that species. It comes also near to *Trichomanes crispatum* (Hook. t. 70); but that species is readily distinguishable by the alated segments of its frond, not being at all undulated, and by the involucre being uniformly solitary, and of a more oval form.

239. H. *secundum,* fronde bipinnatifida, pinnis subflabelliformibus, laciniis linearibus dichotomis serratis secundis, involucris ovalibus subcompressis integerrimis. *A. Rich. Fl. Nov. Zel. p.* 94. *Hook. et Grev. Ic. Fil. t.* 133.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies.*

Obs. A very beautiful species, and distinguished from all others with which we are acquainted, by the secondary segments or divisions of the fronds all pointing one way.

240. H. *multifidum, Sw.—Willd. Sp. Pl.* 5. *p.* 524. *Spreng. Syst. Veg. v.* 4. *p.* 133. *Hook. et Grev. Ic. Fil. t.* 167.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

Obs. Hooker observes of this species, "To judge from the involucre, it seems to be intermediate between the genera *Hymenophyllum* and *Trichomanes*, to the latter of which Mr. Menzies originally referred it, and we fear there are many in the same predicament."

241. H. *semibivalve,* frondibus bipinnatifidis lanceolatis glabris, laciniis linearibus obtusis glabris immarginatis, involucris rotundato-urceolatis semi-immersis, parte superiore solummodo bivalvi. *A. Rich. Nov. Zel. p.* 94. *Hook. et Grev. Ic. Fil. t.* 83.

New Zealand (Middle Island). Dusky Bay.—1791, *A. Menzies, Esq.*

Obs. "This species may also be reckoned intermediate between *Hymenophyllum* and *Trichomanes*, the lower half, or even more of the involucre being sunk into the extremity of the frond, and the upper portion forming two short almost semicircular lips or valves." W. J. H.

242. H. *minimum;* perpusillum, caudice filiformi repente radicante, fronde brevi-stipitata pinnatifida colorata (purpurea) glaberrima, laciniis inferioribus profunde bipartitis oblongis obtusis marginibus argute serratis, involucro oblongo obtuso terminali semibivalvi, valvis spinuloso-dentatis. *A. Rich. Fl. Nov. Zel. p.* 91. *t.* 14. *f.* 2.

New Zealand.—1827, *D'Urville.*

243. H. *Tunbridgense, Sm.—Willd. Sp. Pl.* 5. *p.* 133. *Br. Prodr.* 1. *p.* 159. *Spreng. Syst. Veg.* 4. *p.* 133. *A. Rich. Fl. Nov. Zel. p.* 91. *Engl. Bot. t.* 162.—H. cupressiforme. *Labill. Nov. Holl.* 2. *p.* 102. *t.* 250. *f.* 2.

New Zealand (Northern Island). On wet rocks, in shaded woods, Bay of Islands, &c.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

244. H. *bivalve, Sw.—Willd. Sp. Pl.* 5. *p.* 523. *Spreng. Syst. Veg.* 4. *p.* 133. *A. Rich. Fl. Nov. Zel. p.* 93. *Schk. Fil. p.* 135. *b.*

New Zealand.—1827, *D'Urville.*

245. H. *demissum, Sw.—Willd. Sp. Pl.* 5. *p.* 528. *Spreng. Syst. Veg.* 4. *p.* 132. *A. Rich. Fl. Nov. Zel. p.* 92. *Schk. Fil. t.* 135. *b.*

New Zealand (Middle Island). Astrolabe Harbour, Tasman's Bay.—1827, *D'Urville.*

PLANTÆ VASCULARES.

I. *Endogenæ seu Monocotyledones.*

GRAMINEÆ.

1. AGROSTIS. *L.*

246. A. *crinita*. *Br. Pr.* 1. *p.* 170. *A. Rich. Fl. Nov. Zel. p.* 136. *Ræm. et Sch. Syst. Veg.* 2. *p.* 371.—Anthoxanthum crinitum, *Forst.*—*Labill. Nov. Holl.* 2. *p.* 215. *t.* 263.—Apera crinita. *Pal. de Beauv. Agrost. p.* 31.

New Zealand (Northern Island). Dry hills, Wangaroa, &c.—1826, *A. Cunningham.* (Middle Island).—1773, *G. Forster.*

247. A. *ovata*. *Br. Prodr.* 1. *p.* 171. *A. Rich. Fl. Nov. Zel. p.* 128. *Labill. Nov. Holl.* 1. *p.* 19. *t.* 21.—Cinna ovata. *Kunth, Gram.* 1. *p.* 67.—Echinopogon ovatus. *Palis. de Beauv. Ag. p.* 42. *Ræm. et Sch. Syst. Veg.* 2. *p.* 421.

New Zealand (Northern and Middle Islands). Dry woods.—1826, *A. Cunningham.*—1827, *D'Urville.*

248. A. *rigida*; culmis cæspitosis rigidis, foliis lineari-convolutis, panicula elongata, ramis semiverticillatis ramosis, glumæ palea exteriori apice acuta subpubescenti, interna acuta glabra. *A. Rich. Nov. Zel. p.* 124.

New Zealand (Middle Island). Cook's Strait.—1827, *D'Urville.*—*Pati* of the natives.

249. A. *procéra*; culmis—, panicula maxima bipedali, ramis semiverticillatis ramosis, glumæ palea exteriori apice obtusa glabra, interne obtusa glabra. *A. Rich. Fl. Nov. Zel. p.* 125.

New Zealand.—1827, *D'Urville.*

250. A. *conspicua*. *Willd. Sp. Pl.* 1. *p.* 456. *Ræm. et Sch. Syst. Veg.* 2. *p.* 364. *A. Rich. Fl. Nov. Zel. p.* 127.—Achnatherum conspicuum. *Pal. de Beauv. Agr. p.* 19.—Arundo conspicua. *Forst. Prodr. n.* 48.

New Zealand (Northern Island). Banks of rivers, Bay of Islands, &c.—1826, *A. Cunningham.*

251. A. *æmula*. *Br. Prodr.* 1. *p.* 172. *A. Rich. Fl. Nov. Zel. p.* 128.—Vilfa æmula. *Pal. de Beauv. Agrost. p.* 16.—Deyeuxia æmula. *Kunth, Agrost. p.* 244.

The *Pelé* or *Pelai* of the natives.—New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

252. A. *Billardieri*. *Br. Prodr.* 1. *p.* 171. *A. Rich. Fl. Nov. Zel. p.* 130. *Ræm. et Sch. Syst. Veg.* 2. *p.* 360.—Deyeuxia Billardieri. *Kunth, Agrost. p.* 244.—Avena filiformis. *Labill. Nov. Holl.* 1. *p.* 24. *t.* 31. *excl. syn. Forst.*

New Zealand (Middle Island). Gravelly Beach at Astrolabe Harbour.—1827, *D'Urville.*—*Pereshia* of the natives.

253. A. *Forsteri*; panicula pedali erecta, ramis verticillatis apice ramosis glabris, lepicena glumaque glabris. *A. Rich. Fl. Nov. Zel. p.* 131. *Ræm. et Sch. Syst. Veg.* 2. *p.* 359.—Avena filiformis. *Forst. Prodr. n.* 46. (*non Labill.*)—Deyeuxia Forsteri. *Kunth, Gram.* 1. *p.* 77.

New Zealand. 1773, *G. Forster.*—Dry open spots. 1828, *A. Cunningham.*

254. A. *pilosa*; panicula pedali erecta pyramidali, ramis semiverticillatis pluries ramosis pendulinis hirtellis, valvis dorso denticulatis, palea exteriore glumæ pilosa. *A. Rich. Fl. Nov. Zel. p.* 134. *t.* 23.

New Zealand (Northern Island). Shady woods on the Keri-Keri River.—1828, *A. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

Obs. Culmus erectus, bi- (fere quinque) pedalis et ultra, teres, asper. *A. Rich.*

2. PHALARIS. *L.*

255. P. *Canariensis*. *L.*—*Ræm. et Sch. Syst. Veg.* 2. *p.* 402. *A. Rich. Fl. Nov. Zel. p.* 123. *Forst. Prodr. n.* 34.

New Zealand (Northern Island). Summits of hills cleared by the natives. Bay of Islands and its vicinity.—1826, *A. Cunningham.* (Middle Island).—1773, *G. Forster.* "The *Patiti* of the natives of the Bay of Islands." *D'Urville.*

3. DANTHONIA. *De Cand.*

256. D. *pallida*. *Br. Prodr.* 1. *p.* 177. *Ræm. et Sch. Syst. Veg.* 2. *p.* 692.

New Zealand (Northern Island). Open clay-lands, near the Bay of Islands.—1826, *A. Cunningham.*

4. AVENA. *L.*

257. A. *antarctica*; foliis planis panicula composita patenti, calycibus trifloris, flosculis medio aristatis, arista elongata rectiuscula. *Ræm. et Sch. Syst. Veg.* 2. *p.* 676. *Br. Prodr. p.* 209. (in obs.) *A. Rich. Fl. Nov. Zel. p.* 139.—Aira antarctica. *Forst.*—*Willd. Sp. Pl.* 1. *p.* 379.—Torresia antarctica. *Palis. de Beauv. Agrost. p.* 63.

New Zealand (Middle Island). Queen Charlotte's Sound.—1773, *G. Forster.*

Note. A. *sativa*, L., enumerated by A. Richard, was originally introduced by Europæans; but though now perfectly wild in the neighbourhood of the Bay of Islands, it is not an indigenous plant.

5. BROMUS. *L.*

258. B. *australis?* *Br. Prodr.* 1. *p.* 178. *Ræm. et Sch. Syst. Veg.* 2. *p.* 639.

New Zealand (Northern Island). Open situations on the sea-coast, Bay of Islands.—1826, *A. Cunningham.*

6. SCHŒNODORUS. *Pal. de Beauv.*

Spiculæ 5—15-floræ. *Glumæ* valvula inferior sub apice breviter emarginato-dentata, dentibus sæpe barbatis, setigera, superior bifido-dentata. *Stigmata* villosa. *Caryopsis* valvula glumæ superiore subcorticata, sulcata.

259. S. *littoralis;* panicula erecta, spiculis muticis vix calyce longioribus, foliis involutis interne pilosis. *Ræm. et Sch. Syst. Veg.* 2. *p.* 707.—Festuca? littoralis. *Br. Prodr.* 1. *p.* 178. *A. Rich. Fl. Nov. Zel. p.* 123. *Labill. Nov. Holl.* 1. *p.* 22. *t.* 27.

New Zealand, on the sea-shore.—1827, *D'Urville.*

7. TRITICUM. *L.*

260. T. *scabrum. Br. Prodr.* 1. *p.* 178. *A. Rich. Fl. Nov. Zel. p.* 137.—Festuca scabra. *Labill. Nov. Holl.* 1. *p.* 22. *t.* 26.—Agropyron scabrum. *Ræm. et Sch. Syst. Veg.* 2. *p.* 756. *Palis. de Beauv. Agrost. p.* 102.—*Patiti.* Incol.

New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

261. T. *repens, L.—A. Rich. Fl. Nov. Zel. p.* 138.

New Zealand. *D'Urville.*

Obs. "The specimens received from New Zealand," says M. Richard, "are a beardless variety of *T. repens.* En les comparant avec ceux d'Europe, je n'ai pu trouver aucune différence." *A. Rich.*

8. POA. *L.*

262. P. *australis. Br. Prodr.* 1. *p.* 179. *A. Rich. Fl. Nov. Zel. p.* 141.—P. anceps. *Forst. Prodr. n.* 43. *Ræm. et Sch. Syst. Veg.* 2. *p.* 550.—Arundo poæformis. *Labill. Nov. Holl.* 1. *p.* 27. *t.* 35.

New Zealand (Northern Island). Open Fern-lands on the shores of the Bay of Islands.—1826, *A. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

263. P. *imbecilla* (Soland. MSS.); panicula laxa diffusissima, spiculis 5-floris linearibus, flosculis remotiusculis, foliis linearibus longissimis. *Ræm. et Sch. Syst. Veg.* 2. *p.* 550. *Spreng. Mant.* 1. *p.* 33. *Forst. Prodr. n.* 499.—Poa Sprengelii. *Kunth, Agrost. p.* 363.

New Zealand.—1769, *Banks* and *Solander.*

264. P. *cæspitosa. Sol. MSS. Forst. Prodr. n.* 498. (absq. descr.) *non Poir.—Spreng. in Mem. Acad. Petropol.* 1810. *p.* 302.

New Zealand.—1769, *Banks* and *Solander.*

9. ARUNDO. *L.*

265. A. *australis;* foliis linearibus longissimis acutis retrorsum scabris, panicula terminali pyramidali, spiculis bifloris, valvis lanceolatis acutis glabris, palea exteriori apice bifida aristata, interiori integra acuta. *A. Rich. Fl. Nov. Zel. p.* 121.

New Zealand (Northern Island). Sand heads of the Hokianga River.—1826, *A. Cunningham.* (Middle Island). Astrolabe Harbour, on the sea-shore.—1827, *D'Urville.* Kahao of the natives. *D'Urville.*

Obs. *Culmus* erectus 6—8 pedalis, teres, glaberrimus, lævis, nodosus. *Flores* paniculati, panicula terminali bipedalis ramosissima.

10. PASPALUM. *L.*

266. P. *orbiculare. Forst. Prodr. n.* 35. *Br. Prodr.* 1. *p.* 188. *A. Rich. Fl. Nov. Zel. p.* 140.

New Zealand (Middle Island). Open country near the Bay of Islands.—1827, *D'Urville.*—*Tuhui* of the natives.—So scanty is the pasturage on the Northern Island, that the British Resident, living near the Bay of Islands, collected a bushel of the seed of this grass, to sow near his dwelling, from which he hoped to derive food for his horse, and thus prevent the animal from straying far and wide in search of provender. *R. C.*

11. ROTTBOELLIA. *L. fil.*

267. R.? *uniflora;* glaberrima, spica brevi conjugata, floribus pedicellatis, gluma bivalvis uniflora, foliis setaceis convolutis, culmo compressiusculo foliorum vaginis tecto.

New Zealand (Northern Island). Shores of the Bay of Islands.—1834, *R. Cunningham.*

12. SPINIFEX. *L.*

268. S. *sericeus. Br. Prodr.* 1. *p.* 198. *A. Rich. Fl. Nov. Zel. p.* 122.—Ixalum inèrme. *Sol. MSS. Forst. Prodr. n.* 564.

New Zealand (Northern Island).—1769, *Banks* and *Solander.* Sands of the coast opposite the Cavallo Islands, &c.—1834, *R. Cunningham.* (Middle Island). Sandy shores of Cook's Strait.—1827, *D'Urville.*—*Moa,* Incol.—*D'Urville.*

13. TORRESIA. *Palis. de Beauv.*

Axis spicatus. *Spica* composita. *Glumæ* inæquales, 3-floræ, flosculis breviores. *Flosculi* laterales 2-paleacei masculi. *Palea* inferiore subapice crenato-setigera, seta brevi recta, superiore bifido-dentata integra. *Stigmata* aspergilliformia.

269. T. *redolens;* glumis trifloris, flosculis lateralibus masculis aristatis margine pilosis (valvula interiore calycis basi trinervi, pilis marginalibus dorsalibusque flosculorum lateralium strictis longioribus). *Ræm. et Sch. Syst. Veg.* 2. *p.* 516.—Holcus redolens. *Sol. MSS. Forst. Prodr. n.* 563. *non Vahl.*

New Zealand.—1769, *Banks* and *Solander.* (Middle Island). Marshy grounds in the neighbourhood of the Bay of Islands. —1826, *A. Cunningham.*

OBS. A Grass of strong growth, having the fragrance of *Anthoxanthum,* by which it may be readily detected in swampy hollows between the Bay of Islands and the Keri-Keri River.

CYPERACEÆ. *D C.*

1. CYPERUS. *L.*

270. C. *ustulatus;* culmo triquetro lævi, foliis linearibus culmo longioribus, margine costaque denticulatis, umbella subtiradiata, radiis simplicibus, spiculis 6—8 floris compressis sessilibus congesto-spicatis, squamis carinatis striatis obtusis subapice mucronatis, involucro polyphyllo foliolis umbella longioribus. *A. Rich. Fl. Nov. Zel. p.* 101. *t.* 17.—*Pouketanata* of the natives.

New Zealand (Northern Island). Shaded woods subject to inundation, Kana-Kana Rivers.—1826, *A. Cunningham.* (Middle Island). Very frequent near torrents.—1827, *D'Urville.*

2. FUIRENA. *Rottb. L. fil. Br.*

271. F. *rubiginosa;* spiculis racemosis axillaribus, foliis subteretibus vaginantibus. *Spreng. Mant.* 1. *p.* 29. *Ræm. et Sch. Syst. Veg.* 2. *p.* 236.—Schœnus rubiginosus. *Sol. MSS. Forst. Prodr. n.* 498.

New Zealand.—1769, *Banks* and *Solander.*

OBS. Culmus cubitalis, teres, glaber, basi vaginis foliorum vestitus, supra ramosus.

3. ISOLEPIS. *R. Br.*

272. I. *nodosa. Br. Prodr.* 1. *p.* 221. *A. Rich. Fl. Nov. Zel. p.* 104. *t.* 18.

New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

273. I. *setacea. Br. Prodr.* 1. *p.* 222. *A. Rich. Fl. Nov. Zel. p.* 104 (I. setosa). *Ræm. et Sch. Syst. Veg.* 2. *p.* 108.—Scirpus setaceus, *L.—Engl. Bot. t.* 1693.

New Zealand (Northern Island). Boggy grounds, Bay of Islands.—1834, *R. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

274. I. *spiralis;* foliis radicalibus rigidis linearibus spinuloso-dentatis, culmo angulato basi nudo superne foliifero, foliis basi dilatatis in axilla marginibus patula floriferis, spiculis numerosissimis confertis, sessilibus multifloris fuscis et quasi in spicam dispositis. *A. Rich. Fl. Nov. Zel. p.* 105. *t.* 19.

New Zealand (Northern Island). Rooting in the sands of the sea-shore with *Spinifex.* — 1826, *A. Cunningham.*—1827, *D'Urville.*

2. SCIRPUS. *L.*

275. S. *lacustris. Br. Prodr.* 1. *p.* 223. *A. Rich. Fl. Nov. Zel. p.* 103. *Engl. Bot. t.* 666. *Koponpon* of the natives.

New Zealand (Middle Island). On the banks of rivers, Astrolabe Harbour.—1827, *D'Urville.*

3. VAUTHIERA. *A. Rich.*

GEN. CHAR. "*Spiculæ* unifloræ, squamis imbricatis, exterioribus vacuis; squamulæ hypogynæ tres membranaceo-hyalinæ, acutæ; ovarium in disco cupulæformi lobato insertum. *Stylus* simplex continuus. *Stigmata* tria linearia. *Nux* obovata, obsolete triquetra, apice tomentoso-sphacelato acuminata, disco cincta.—Herbæ rigidæ, foliis teretibus acutis, basi membranaceo-dilatatis, spiculis congestis, squamis spathæformibus cinctis." *A. Rich.*

276. V. *australis. A. Rich. Fl. Nov. Zel. n.* 107. *t.* 20.

New Zealand.—1827, *D'Urville.*

4. ELÆOCHARIS. *R. Br.*

277. E. *sphacelata. Br. Prodr.* 1. *p.* 224. *Ræm. et Sch. Syst. Veg.* 2. *p.* 149.

New Zealand. In swamps near the Bay of Islands.—1834, *R. Cunningham.*

278. E. *acicularis. Br.—Ræm. et Sch. Syst. Veg.* 2. *p.* 154.—Scirpus acicularis, *L.—Engl. Bot. t.* 749.—Isolepis acicularis. *A. Rich. Fl. Nov. Zel. p.* 163.

New Zealand (Middle Island). In marshes on the shores of Astrolabe Harbour.—1827, *D'Urville.*

OBS. "Du reste, je n'ai aperçu aucune trace des soies hypogynes, qui, selon Sprengel, Ræmer et Schultes, existaient dans cette plante et en feraient une espèce du genre *Elæocharis.*" *A. Rich.*

5. SCHŒNUS. *L.*

279. S. *imberbis*. *Br. Prodr.* 1. *p.* 231. *Rich. Fl. Nov. Zel. p.* 108. *Ræm. et Sch. Syst. Veg.* 2. *p.* 75.

New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

Obs. Culmus erectus, bipedalis, gracilis, teres, glaber, striatus.

6. LEPIDOSPERMA. *Labill.*

280. L. *elatior?* *Br. Prodr.* 1. *p.* 234. *Labill. Nov. Holl.* 1. *p.* 15. *t.* 11.

New Zealand (Northern Island). Shores of the Bay of Islands.—1834, *R. Cunningham.*

7. LAMPOCARYA. *R. Br.*

281. L. *lacera;* tetrandra, foliis linearibus, floribus paniculatis, panicula elongata ramosa, spiculis approximatis alternis sessilibus, squamis intimis margine scariosis dissectis. *A. Rich. Fl. Nov. Zel. p.* 109.

New Zealand.—1827, *D'Urville.*

Obs. Culmus erectus, teres, 3—4 pedalis, nodosus, glaber.

282. L. *setifolia;* tetrandra, foliis angustissimis convoluto-setaceis, floribus paniculatis panicula elongata, spiculis sessilibus aut pedicellatis, squamis externis apice in seta desinentibus, interioribus acutis integris, intima truncata minima. *A. Rich. Fl. Nov. Zel. p.* 111.

New Zealand.—1827, *D'Urville.*

Obs. Culmus teres, bipedalis et ultra, simplex, scaberulus.

283. L. *affinis;* foliis revolutis filiformibus, panicula composita interrupta foliata longioribus, spiculis ovato-lanceolatis acutis; akeniis ovatis apice trigono-pyramidatis acutis fulvis, filamentis elongatis externe suspensis. *Brongn. in Duperr. Voy. p.* 166. *t.* 19. *Endl. Syn. Fl. Insul. Occ. Austr. in Ann. der Wien. Mus. band,* 1. *p.* 161.

New Zealand.—*D'Urville* and *Lesson.*

8. GAHNIA. *Forst.*

284. G. *procera, Forst.*—*Willd. Sp. Pl.* 2. *p.* 244. *Ræm. et Sch. Syst. Veg.* 7. *p.* 1362. *A. Rich. Fl. Nov. Zel. p.* 112.

New Zealand.—1773, *G. Forster.*

9. MORELOTIA. *Gaudich.*

285. M. *gahniæformis;* panicula subcontracta, ramis inferioribus longius pedicellatis, nucibus ovoideis nitentibus atris. *Gaud. in Voy. Uran. p.* 416. *t.* 28. *A. Rich. Fl. Nov. Zel. p.* 115.

New Zealand (Northern Island). Bay of Islands.—1827, *D'Urville.*—1834, *R. Cunningham.*

10. UNCINIA. *Pers.*

286. U. *australis. Pers. Syn.* 2. *p.* 534.—Carex uncinata. *Forst. Prodr. n.* 338.—Uncinia compacta. *A. Rich. Fl. Nov. Zel. p.* 118. *non Br.*—*Coucougori* of the natives.

New Zealand (Middle Island). Margins of woods, Bay of Islands.—1826, *A. Cunningham.* Near torrents.—1827, *D'Urville.*

11. CAREX. *L.*

287. C. *polystachya;* culmo triquetro acuto, foliis longioribus linearibus acutis retrorsum scabris, spicis masculis 1—3 terminalibus, fœmineis 8—10 pendulinis, infimis pedunculatis, squamis orbiculatis apice emarginato abrupte acuminatis acumine longiori, stigmatibus duobus, akenio compresso lenticulari. *A. Rich. Fl. Nov. Zel. p.* 118. *t.* 21.—*Raou-tay* of the natives. *D'Urville.*

New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

288. C. *punctulata;* culmo triquetro lævi, foliis longioribus linearibus retrorsum scabris, spica mascula unica sessili, fœmineis 4 pedunculatis, squamis oblongo-lanceolatis, akenio oblongo fusiformi longe acuminato striato punctulato. *A. Rich. Fl. Nov. Zel. p.* 119.

New Zealand (Northern Island). Shores of the Bay of Islands.—1834, *R. Cunningham.*—1827, *D'Urville.*

289. C. *recurva;* spicis masculis binis sessilibus, androgynis cylindraceis subquatinis remotis pedunculatis basi masculis, fructibus ovatis triquetris rostratis bifidis recurvatis. *Pers. Syn.* 2. *p.* 540. *Schk. Caric. p.* 119. *t.* 3. *n. n. f.* 84.—C. Forsteri. *Willd. Sp. Pl.* 4. *p.* 248.—C. debilis. *Forst. Prodr. n.* 550.—C. hamata. *Sol. MSS. Forst. Prodr. n.* 548. *conf. Steud. nomencl.*

New Zealand.—1769, *Sir Jos. Banks.*

290. C. *geminata;* spicis masculis tribus pedunculatis, androgynis subœtonis pedunculatis pendulis geminatis remotis apice masculis, fructibus subglobosis brevissime rostratis ore indivisis. *Pers. Syn.* 2. *p.* 540. *Willd. Sp. Pl.* 4. *p.* 249. *Schk. Caric. p.* 65. *t.* 11. *f.* 75.—C. ternaria. *Sol. MSS. Forst. Prodr. n.* 549.

New Zealand.—1769, *Sir Jos. Banks.*

RESTIACEÆ. *R. Br.*

1. LEPTOCARPUS. *R. Br.*

291. L. *simplex. Br. Prodr.* 1. *p.* 250. *A. Rich. Fl. Nov. Zel. p.* 142.—Restio simplex. *Forst. Prodr. n.* 367.—*Oui-Oui.* Incol. (*D'Urville.*)

New Zealand (Northern Island). Sandy shores of the Bay of Islands.—1826, *A. Cunningham.* (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

JUNCEÆ. *D C.*

1. JUNCUS. *L.*

292. J. *maritimus, Lam.—Br. Prodr.* 1. *p.* 258. *Engl. Bot. t.* 1725. *A. Rich. Fl. Nov. Zel. p.* 145.

New Zealand.—1827, *D'Urville.*

293. J. *effusus, L.—Sm.—Br. Prodr.* 1. *p.* 258. *Engl. Bot. t.* 836.—J. communis β. *Mey. Syn. Junc. p.* 12. *A. Rich. Fl. Nov. Zel. p.* 145.

New Zealand (Northern Island). On wet grounds, Wangaroa.—1826, *A. Cunningham.*—1827, *D'Urville.*

294. J. *filiformis, L.—Ræm. et Sch. Syst. Veg.* 7. *p.* 189. *A. Rich. Fl. Nov. Zel. p.* 145. *Engl. Bot. t.* 1775.

New Zealand.—1827, *D'Urville.*

Obs. What *Juncus tenax*, Sol. MSS. (enumerated by Forster in his *Prodr. n.* 514, without a description,) may be, of which specimens were collected in New Zealand, in the first Voyage of Capt. Cook, appears doubtful. Schultes observes, in speaking of the synonymy of *J. glaucus* (*Sm. et E. Bot.*), "An huc *J. tenax*, Forst. n. 514, dubios inter solo nomine adductus e Nova Zeiandia? Ita videtur cl. Dryander in litt. ad Montin." Schult. Syst. Veg. 7. p. 182.

2. LUZULA. *D C.*

295. L. *picta;* foliis linearibus pilosis, panicula e glomerulis 4—10 floris constanti, perigonii foliolis æqualibus lanceolatis acutissimis margine membranaceo-hyalinis, medio linea longitudinali brunnea notatis, capsula obovoideo-acuminata longioribus, seminibus inappendiculatis basi tomentosis. *A. Rich. Fl. Nov. Zel. p.* 148.

New Zealand (Middle Island). Astrolabe Harbour.—1827, *D'Urville.*

3. ASTELIA. *Banks* and *Soland. R. Br.*

296. A. *Banksii;* foliis elongato-ensiformibus latioribus carinatis utrinque sericeis, panicullis coarctatis, ramulis strictis elongatis, perianthiis urceolatis sexfidis, bacca globosa triloculari, scapo bracteisque sericeo-lanatis basi valde lanuginosis.—Hamelinia veratroides. *A. Rich. Fl. Nov. Zel. p.* 158. *t.* 24.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.*—An Epiphyte, growing in tufts on trees in all the forests, and occasionally in shaded rocks.—1826, *A. Cunningham.*

297. A. *Solandri;* foliis elongato-ensiformibus angustioribus sericeis, paniculis laxiusculis, perianthiis urceolatis sexpartitis baccatis.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.*

Habit of growth of the preceding; but it differs from that species in having the leaves much narrower, with less woolly bases, and a less crowded panicle of flowers.

PALMÆ. *L.*

1. ARECA. *L.*

298. A. *sapida;* pinnis lanceolatis acutis nervosis terminalibus præmorsis, costis rachique subtus sanguineo-lepidotis, spadicibus lævibus, calycis masculi foliolis lineari-filiformibus, fœminei ovatis acutis, fructibus globosis, albumine æquabili. *Endl. Prodr. Fl. Norf. p.* 26. *Soland. MSS. Forst. Prodr. n.* 592. *Pl. escul. p.* 66. *A. Rich. Fl. Nov. Zel. p.* 157.—*Ic. Ferd. Bauer, Illustr. Pl. Norf. Insul. t.* 179, 180, 202, and 203. (*Endl.*)

New Zealand (Northern Island). Tolago Bay (lat. 38° 22′ S.).—1769, *Banks* and *Solander.* Summits of the hills in the vicinity of Wangaroa.—1826, *A. Cunningham.* (Middle Island). Queen Charlotte's Sound.—1773, *G. Forster.*

ASPHODELEÆ. *R. Br.*

1. ARTHROPODIUM. *R. Br.*

299. A. *cirrhatum;* racemo diviso, bracteis foliaceis, pedicellis fasciculatis, petalis interioribus integerrimis, filamentorum dimidio barbato basi biappendiculato, foliis lanceolato-ensiformibus. *Br. in Bot. Mag.* 2350. *Bot. Reg. t.* 709. *Schult. Syst. Veg.* 7. *p.* 441.—Anthericum cirrhatum. *Forst.—Willd. Sp. Pl.* 2. *p.* 146. *A. Rich. Fl. Nov. Zel. p.* 155.—A. latifolium. *Banks* and *Soland. MSS.* 1769.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* Dry rocky spots, and near the margins of woods on the shore of the Bay of Islands, &c.—1826, *A. Cunningham.*

2. DIANELLA. *Lam.*

300. D. *intermedia;* foliis radicalibus

congestis lineari-lanceolatis elongatis carina marginibusque denticulato-asperis, basi complicata scapoque angulato lævibus, paniculæ ramis ramulisque arcuatis, pedicellis nutantibus perianthium subsuperantibus. *Endl. Prodr. Fl. Norf. p.* 28. *Ic. Ferd. Bauer, Illust. Fl. Norf. t.* 178.

New Zealand (Northern Island). Open fern-lands, Bay of Islands.—1834, *R. Cunningham.*

3. DRACÆNA. *L.*

301. D. *indivisa. Forst.—Willd. Sp. Pl.* 2. *p.* 186. *Schult. Syst. Veg.* 7. *p.* 339. *A. Rich. Fl. Nov. Zel. p.* 148.

New Zealand (Middle Island). Dusky Bay, scopulis mare sæpe proximis.—1773, *G. Forster.*

4. CORDYLINE. *Commers. Br. Prodr.*

302. C. *australis;* arborea ramosa, foliis lanceolatis acutis muticis planis sessilibus confertis basi dilatatis, racemis terminalibus paniculatis erectis, floribus congestis, bracteis ovatis, exteriore paulo majore. *Endl. Prodr. Fl. Norf. p.* 29.—Dracæna australis. *Forst.—Willd. Sp. Pl.* 2. *p.* 156. *Schult. Syst. Veg.* 7. *p.* 339. *A. Rich. Fl. Nov. Zel. p.* 149. *Bot. Mag. t.* 2835.—D. obtecta. *Grah. in Edinb. Phil. Journ.* 1827. *p.* 175.

New Zealand (Middle Island). Queen Charlotte's Sound. —1773, *G. Forster.* (Northern Island). Shores of the Bay of Islands, &c.—1826, *A. Cunningham.—Ti* of the natives.

303. C. *stricta;* fruticosa stricta, foliis lineari-lanceolatis mucronatis recurvatis sessilibus margine scabriusculis, racemis lateralibus paniculatis cernuis, floribus laxiusculis, bracteis exterioribus lanceolato-mucronatis, interiore pedicellum vix æquante parum majoribus. *Endl. Syn. Fl. Insul. Occ. Austr. in Ann. der Wien. Mus. band.* 1. *p.* 162.—Dracæna stricta. *Sch. Syst. Veg.* 7. *p.* 339. *Bot. Mag. t.* 2575. *Bot. Reg. t.* 956.

New Zealand. *Endl.*

5. PHORMIUM. *Forst.*

304. P. *tenax. Forst. Char. Gen. t.* 24. *Willd. Sp. Pl.* 2. *p.* 171. *Sch. Syst. Veg.* 7. *p.* 621. *A. Rich. Fl. Nov. Zel. p.* 153. *Endl. Prodr. Fl. Norf. p.* 27. *Bot. Mag. t.* 3199.—Chlamydia tenacissima. *Banks* and *Sol. MSS.*

New Zealand. In all parts of the Northern Island, as well in inland swamps as in salt marshes on the coast.—1769, *Sir Jos. Banks,* &c. *Koradi* of the natives (*A. Cunningham*). *Kekkie,* according to *D'Urville.* New Zealand Flax of Europeans.

SMILACEÆ. *R. Br.*

1. RIPOGONUM. *Forst. Gen.*

305. R. *parviflorum, Br.;* caule inermi (radicante) foliis oppositis (ovato-lanceolatis), racemis divisis, perianthio antheris 5—6ies breviore. *Br. Prodr.* 1. *p.* 293, *in obs. Schult. Syst. Veg.* 7. *p.* 313. —R. scandens. *Forst. Gen. Ch. t.* 25. *A. Rich. Fl. Nov. Zel. p.* 151.—Smilax Ripogonum. *Forst. Prodr. n.* 372. *Pers. Syn.* 2. *p.* 620. *Willd. Sp. Pl.* 4. *p.* 784.—*Karaeo* of the natives. *R. Cunningham.*

New Zealand (Middle Island). In the forests.—1773, *G. Forster.* (Northern Island). In dense forests, where it climbs to the summit of the loftiest trees. Wangaroa, Hokianga, &c.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

IRIDEÆ. *Juss.*

1. LIBERTIA. *Spreng.* (*Renealmia. R. Br.*)

Perianthium; sexpartitum rostratum, laciniis exterioribus minoribus angustioribus. *Filamenta* distincta v. basi connata. *Stigmata* 3 simplicia. *Calyx* subglobosa. *Spreng.*

306. L. *grandiflora;* filamentis basi cohærentibus, perianthii foliolis interioribus 4—5ies majoribus.—*Sweet, Hort. Brit. p.* 498.—Renealmia grandiflora. *Br. MSS. conf. Prodr. Addenda.*

New Zealand.—1769, *Banks* and *Solander.*

307. L. *ixioides;* caule superne paniculato, umbella 3—4 flora, pedicellis glabris, foliis (1—3 pedalibus) striatis margine lævibus, filamentis basi conniventibus, perianthio foliolis interioribus orbiculatis exterioribus duplo majoribus. *Spreng. Syst. Veg.* 1. *p.* 168 (*excl. Syn. Feuill.*).—Sisyrinchium ixioides. *Forst. Prodr. n.* 325. *A. Rich. Fl. Nov. Zel. p.* 161.—Ferraria ixioides. *Willd. Sp. Pl.* 3. *p.* 582. *Ræm. et Sch. Syst. Veg.* 1. *p.* 496.

New Zealand. — 1773, *G. Forster.* (Northern Island). In shady woods near the Keri-Keri River.—1826, *A. Cunningham.*—1834, *R. Cunningham.*

308. L. *micrantha;* scapo subsimplicer s. simpliciter diviso bracteato bifloro, pedicellis villosiusculis, foliis (3—5 uncialibus) nervosis margine scabris, filamentis basi connatis, perianthii foliolis interioribus ovalibus exterioribus ovato-oblongis parum minoribus.

New Zealand (Northern Island). In dense woods, growing on the naked roots of trees; Wangaroa, &c. *A. Cunning-*

ham; also on humid rocky banks of the Keri-Keri River, below the Falls.—1834, *R. Cunningham.*

ORCHIDEÆ. *R. Br.*

* *Terrestres.*

1. THELYMITRA. *Forst.*

309. T. *Forsteri;* perianthio erectiusculo patulo, cuculli laciniis extimis approximatis antice penicillatis intermedia dorso nudo emarginata, lobulis rotundatis undulatis margine incurvatis, spica multiflora (5—7). *Sw.—Pers. Syn. Pl.* 2. *p.* 511. *A. Rich. Fl. Nov. Zel. p.* 165. *t.* 25. *f.* 2. —T. longifolia. *Forst. Gen. Char. n.* 49.

New Zealand (Middle Island).—1773, *G. Forster.* (Northern Island). Shores of the Bay of Islands, in open fern-lands. —1826, *A. Cunningham.*

Obs. Perianthii foliola tres exteriores pallido-purpureæ, interiores 3 albæ.

2. ORTHOCERAS. *R. Br.*

310. O. *strictum. Br. Prodr.* 1. *p.* 317. *Spreng. Syst. Veg. v.* 3. *p.* 712.—Diuris Novæ Zelandiæ. *A. Rich. Fl. Nov. Zel. p.* 163. *t.* 25. *f.* 1.—Ophrys cornuta. *Sol. MSS.* (1769). *Makukia* of the natives. *R. Cunningham.*

New Zealand (Northern Island).—1769, *Banks* and *Solander.* On hills among Fern; Bay of Islands, Wangaroa, &c.— 1834, *R. Cunningham.*

3. MICROTIS. *R. Br.*

311. M. *Banksii;* perianthii foliolis inferioribus ovato-lanceolatis subpatentibus, interioribus lineari-oblongis obtusiusculis, labello oblongo-cuneato lobato, dimidio inferiore dilatato retuso, disco verrucoso marginibus tuberculato-incrassatis, spicæ floribus præcipue distinctis, inferioribus distantibus. *A. Cunningh. in Bot. Mag. t.* 3377.—Ophrys unifolia. *Forst. Prodr. n.* 311.—Epipactis porrifolia. *Sw. Less. Syn.* 2. *p.* 513. *Willd. Sp. Pl.* 4. *p.* 89.— M. porrifolia. *Spreng. Syst. Veg.* 3. *p.* 713.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* In open fern-grounds between the Bay of Islands and Wangaroa. —1834, *R. Cunningham.*

4. ACIANTHUS. *R. Br.*

312. A. *rivularis;* scapo bibracteato unifloro, perianthii foliolis quatuor æqualibus utrinque linearibus longissimis filiformibus, labello cordato acuminato venoso corrugato, marginibus tenuissime crenulatis.

New Zealand (Northern Island). Discovered growing among moss upon rocks in the bed of a briskly running rivulet, flowing through a deep shaded ravine near Wangaroa, Nov. 1826.—*A. Cunningham.* —1833, *R. Cunningham.*

5. PTEROSTYLIS. *R. Br.*

313. P. *Banksii;* caule unifloro, foliis (caulinis) lato lanceolatis inferne carinatis basi vaginantibus, labelli lamina oblonga obtusa apice subuncinata appendice penicillato. *Br. in Herb. Banks. Bot. Mag. t.* 3172.—P. macrophylla. *A. Cunn. MSS.* 1826. *Tae-toe,* or *Mar-ru* of the natives.

New Zealand.—1769, *Sir Jos. Banks.* Banks of the Kana-Kana River, Bay of Islands.—1826, *A. Cunningham.* Wangaroa.—1834, *R. Cunningham.*

6. GASTRODIA. *R. Br.*

314. G. *sesamoides? Br. Prodr.* 1. *p.* 330.

New Zealand (Northern Island). Vicinity of Wangaroa.—1834, *R. Cunningham.*

Note.—This species, found sparingly in New Zealand, may perhaps prove distinct from the plant of Port Jackson, but the fragment of a specimen with which I have been furnished, has not enabled me to determine it.

** *Parasiticæ.* Potius Epiphytæ.

7. EARINA. *Lindl.*

Gen. Char. *Sepala* erecta, æqualia, acuta, membranacea, carinata. *Petala* carnosa, obtusata. *Labellum* carnosum, posticum, cucullatum, trilobum, disco nudo, cum columna continuum et subparallelum. *Columna* teres, nana, stigmatis obliqui labio inferiore prominulo. *Clinandrium* proclive. *Antheræ* bilocularis. *Pollinia* 4, per paria cohærentibus, collateralia.—Herba *caulescens, rhizomate articulato, repente.* Folia *linearia, disticha, vaginantia.* Flores *parvi, paniculati, bracteis cartilagineis, striatis, cucullatis.* Lindl.

315. E. *mucronata. Lindl. in Bot. Reg. sub t.* 1699.—Epidendrum autumnale. *Forst. Prodr. n.* 319.—Cymbidium autumnale. *Sw.—Willd. Sp. Pl.* 3. *p.* 98. *A. Rich. Fl. Nov. Zel. p.* 169.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* Moist woods, on rocks and trees, Bay of Islands, Wangaroa, &c. —1826, *A. Cunningham.*—1834, *R. Cunningham.* (Middle Island.) Dusky Bay. —1773, *G. Forster.*

OBS. "This genus belongs to *Malaxideæ*, and is related to *Cœlogyne* and *Dilochia*, of the latter of which, in particular, it has much the habit, on a small scale. From the former its wingless column, and from the latter the number of its pollen-masses, sufficiently distinguish it, independently of other points of difference." *Lindley.*

8. DENDROBIUM. *Sw.*

316. D. *Cunninghamii* (*Lindl.*); caulibus gracilibus pendulis ramosis, vaginis foliorum corneis transversim corrugatis squamatis, foliis ovato-linearibus obtusiusculis, pedunculis oppositifoliis bifloris, foliis multo brevioribus, sepalis ovatis acutis, petalis oblongis acutis latioribus, labelli trilobi lobo intermedio subrotundo undulato basi 5-lamellato, lateralibus nanis acutis. *Lindl. in Bot. Reg. t.* 1756.—D. biflorum. *A. Rich. Fl. Nov. Zel. p.* 167. *t.* 26 (*non Sw.*). *Raumangha* of the natives.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* At Wangaroa, growing on trees, *Pohutu-Kaua* (*Metrosideros tomentosa, A. Rich.*), &c.—1834, *R. Cunningham.* (Middle Island). Shores of Astrolabe Harbour, on trees.—1827, *D'Urville.*

"This species is nearly allied to *D. biflorum*, Swz., a native exclusively of the Society Islands, of which I had examined no specimens at the time the Gen. et Spec. Orchid. was published. Having since received that plant in good condition from Mr. Mathews, who found it in Tahiti, hanging from the branches of trees, I am enabled to offer a correct definition[1] of that very rare plant." *Lindley.*

9. BOLBOPHYLLUM. *Aub. du Pet. Thouars. Lindl.*

317. B. *pygmæum*; rhizomate repente filiformi, foliis solitariis subsessilibus ellipticis pubescentibus coriaceis. *Lindl. Gen. et Sp. Orch. p.* 58.—Dendrobis pygmæum. *Sm. in Rees, Cycl.*

New Zealand (Northern Island). At Wangaroa and Hokianga, growing on *Avicennia tomentosa* and *Vitex littorea*, C., trees of the sea-shore. It has also been found near the Waimate, remote from the sea, on fallen timber.—1834, *R. Cunningham.*

NOTE.—*Dendrobium pygmæum* (*A. C. MSS.*, 1824) has somewhat longer, acute, entirely smooth leaves; but I possess no specimens in flower to describe it. If it be a genuine *Dendrobium*, it may be called *D. Caleyi*, the late botanic traveller of that name in Australia having, I believe, first found it in N. S. Wales.

AROIDEÆ. *Juss.*

1. CALADIUM. *Vent. Cels.* 30.

318. C. *esculentum. Vent.—Willd. Sp. Pl.* 4. *p.* 489. *A. Rich. Fl. Nov. Zel. p.* 100.—Colocasia esculenta. *Schott. Melet.* 18.—Arum esculentum. *L.—Forst. Prod. n.* 328.

New Zealand. Cultivated in the Northern Island. *Forster.*

OBS. In Novæ Zelandiæ extremitate boreali colitur, ubi *Tallo*, s. *Tarro* vocatur. *Forst. Pl Esc. p.* 58.

TYPHACEÆ. *D C. Lindl.*

1. TYPHA. *L.*

319. T. *angustifolia. L.—Br. Prodr.* 1. *p.* 338. *A. Rich. Fl. Nov. Zel. p.* 99. *Engl. Bot. t.* 1456.

T. latifolia. *Forst. Prodr. p.* 44. *n.* 336. *nec. L.—Rapou* of the natives, who employ it not only for constructing the walls of their houses, but for thatching the roof.

New Zealand. — 1773, *G. Forster.* (Northern Island). On the muddy banks of rivers, and in marshes on the shore of the Bay of Islands, Wangaroa, Hokianga, &c.—1826, *A. Cunningham.*

PANDANEÆ. *R. Br.*

1. FREYCINETIA. *Gaud. Endl.*

320. F. *Banksii*; dioica? caule scandente radicante, foliis lineari-lanceolatis attenuatis marginibus asperis basi amplexicauli-sessilibus, bracteis lanceolatis acutis subpatentibus valde carnosis, spadicibus fœmineis cylindraceis, ovariis numerosis in phalanges biseriatim connatis, stigmatibus sessilibus hippocrepiformi-emarginatis.—*Ton-warrar* of the natives, who eat the white fleshy bracteas of the flowers, for their sweet sugary juice.

New Zealand (Northern Island).—1769, *Sir Joseph Banks.* Abundant on the banks of the rivers, where permanent humidity prevails, as those of the Kana-Kana and Hokianga. There, by means of

[1] The species, above referred to, has been thus defined by Professor Lindley from Mr. Mathews' specimens.

D. biflorum, caule pendulo gracili tereti, foliis lineari-lanceolatis acuminatis planis, pedunculis bifloris lateralibus e paleis corneis erumpentibus, sepalis petalisque acuminatissimis, labello rhomboideo medio bilamellato trilobo lobis lateralibus acutis nanis intermedio deltoideo acuminato margine fimbriato. *Lindl. in Bot. Reg. fol.* 1756. *Sw. Act. Holm.* 1800. *p.* 246. *Willd. No.* 17.—Epidendrum biflorum. *Forst. Prodr. n.* 318.

HAB. In Societalis Insulis. *G. Forster.* Taheite. *Mathews.*

the twisting radicant stems, it ascends spirally to the summits of the loftiest trees, attaching itself principally to the *Kaikatea* or *Swamp Pine* (*Dacrydium excelsum*, *D.*), whose straight almost undivided trunk often rises to the height of 120 feet. The flowers appear (in Sept.) in the centre of the tufts of leaves, which at short distances clothe the twisting stem as it ascends.—1826, *A. Cunningham.*

ALISMACEÆ. *R. Br.*

1. TRIGLOCHIN. *L.*

321. T. *flaccidum ;* radice fibrosa ? foliis longissimis angustissime linearibus flaccidis (6—8 poll.) scapum spicamque æquantibus, fructibus subrotundis 2—3 carinatis, capsulis 2 (v. 3, tunc una abortiva) stigmatibus turbinatis recurvis. *Tawringha* of the natives.—New Zealand (Northern Island). In salt creeks connected with Wangaroa Harbour.—1834, *A. Cunningham.*

2. POTAMOGETON. *L.*

322. P. *natans ;* foliis natantibus petiolatis ellipticis basi apiceque rotundatis, petiolis complanatis folio longioribus, *var. L.? Br. Prodr.* 1. *p.* 343.

New Zealand (Northern Island). In stagnant waters near the Missionary Station on the Keri-Keri River, Bay of Islands.—1834, *R. Cunningham.*

OBS. The British plant, which is also indigenous to New South Wales and Van Diemen's Land, is described as having elliptical leaves, acute at their points, and often subcordate at their base, in which respects the plant of New Zealand differs, being uniformly obtuse at the apex, and simply rounded towards the base, and narrowing to the flat petiole. The imperfect specimen received, which is wholly without the lower immersed petioles, will not justify its being considered distinct. It is probably a mere modification of Mr. Brown's plant.

(To be continued.)

BOTANICAL INFORMATION.

At p. 247 we promised shortly to give a brief notice of the new and rare plants figured by us in the Second Part of the Icones Plantarum, which was then published; but such has been the accumulation of valuable information from other sources, to which we have wished to give the preference, that it is only now that the Third Part of this work has appeared, that we have been able to afford the space which will enable us to keep our promise. We consequently give a list of the plants of both the Parts, arranged under the respective sources whence they have been derived. The whole of the plants for Part IV. (completing the Second Volume) are ready, and will speedily be published. —JAMESONIANÆ (Columbia). *Stenoglossum subulatum*, Lindl. t. 51.—*Pleurothallis falcata*, Lindl. t. 55.—*Gentiana Jamesoni*, Hook. (*G. Hookeri*, Griseb.) t. 61.—*Stelis lamellata*, Lindl. t. 62.—*Fuchsia dependens*, Hook. t. 65.—*Gaultheria lanigera*, t. 66.—*Viola glandulifera*, Hook. t. 67.—*Baccharis Scolopendra*, Hook. t. 68.—*Polypodium Surucuchensis*, Hook. t. 69.—*Polypodium murorum*, Hook. t. 70.—*Leucodon bartramioides*, Hook. t. 71.—*Lathyrus gladiatus*, Hook. t. 72.—*Lycopodium Pichinchense*, Hook. t. 85.—*Asplenium fragrans*, Hook. t. 88. —DOUGLASIANÆ (N. W. America and Sandwich Islands). *Tropidocarpum scabriusculum*, Hook. t. 52.—*Argyroxiphium Sandwicense*, D C. t. 75.—*Polypodium myriocarpum*, Hook. t. 84.—*Vaccinium cereum*, Forst. t. 87.—GUNNIANÆ (Van Diemen's Land). *Drosera Menziesii*, Br. t. 53.—*D. lunata*, Buch. t. 54.—*D. Arcturi*, Hook. t. 56.—*Phebalium retusum*, Hook. t. 57.—*Cardamine heterophylla*, Hook. t. 58.—*Phebalium montanum*, Hook. t. 59.—*Eriostemon obcordatum*, Cunn. t. 60.—SCHOMBURGKIANÆ (Guiana). *Conohoria castaniæfolia*, St. Hil. t. 63.—*Antonia pilosa*, Hook. t. 64.—FRASERIANÆ (New Holland). *Viscum incanum*, Hook. t. 73.—*Campylanthera Fraseri*, Hook. t. 82.—WALKERIANÆ (Ceylon). *Bassia microphylla*, Hook. t. 74.—*Pothos remotiflorus*, Hook. t. 133.—WRAYANÆ (S. United States). *Dalibarda lobata*, Baldw. t. 76.—LYALLIANÆ (Madagascar). *Clematis pimpinellifolia*, Boj. t. 77.—*C. anethifolia*, Boj. t. 78.—*C. trifida*, Hook. t. 79.—BOJERIANÆ (Madagascar). *Clematis oligophylla*.

Hook. t. 80.—*Vaccinium Emirnense,* Hook. t. 131.—*V. secundiflorum,* Hook. t. 134.—Mathewsianæ (Andes of Peru). *Cremolobus pubescens,* Hook. t. 81.—*Lycopodium scariosum,* Hook. t. 89.—*L. pendulinum,* Hook. t. 90.—*Gleichenia simplex,* Hook. t. 92.—*Prockia completa,* Hook. t. 94.—*Blechnum pectinatum,* Hook. t. 95.—*Acrostichum flabellatum,* Willd. t. 96.—*Cremolobus sinuatus,* Hook. t. 99.—*C. pinnatifidus,* Hook. t. 100.—*Iresine grandiflora,* Hook. t. 102.—*Atropa glandulosa,* Hook. t. 106.—*Atropa dependens,* Hook. t. 107.—*Thibaudia elliptica,* R. et P. t. 108.—*Macleania floribunda,* Hook. t. 109.—*Thibaudia angustifolia,* Hook. t. 110.—*Sphyrospermum myrtifolium,* Hook. t. 112.—*Aphelandra acanthifolia,* Hook. t. 113.—*Escallonia polifolia,* Hook. t. 114.—*Adenaria parvifolia,* Hook. t. 116.—*Pachyphyllum parvifolium,* Lindl. t. 117.—*Pteris flexuosa,* Hook. t. 119.—*Polypodium biauriculatum,* Hook. t. 171.—*Guarea ? microphylla,* Hook. t. 129.—*Rivina inæqualis,* Hook. t. 130.—*Amirola nitida,* Pers. t. 132.—*Gymnostomum setifolium,* Hook. et Arn. t. 135.—*Weissia campylocarpa,* Arn. et Hook. t. 136.—*Hamadryas Andicola,* Hook. t. 137.—*Ilex microphylla,* Hook. t. 139.—*Clavija spathulata,* R. et P. t. 140.—*Ilex crassifolia,* Hook. t. 149.—Harveyanæ (Cape of Good Hope). *Pharnaceum semiquinquefidum,* Hook. t. 83.—*Holothrix Harveyana,* Lindl. t. 103. A., *et H. parvifolia,* t. 103., B.—*Cymbidium plicatum,* Harv. t. 104.—*Harveya Capensis,* Hook. t. 118.—Tweedianæ (Extratropical S. America). *Polypodium Tweedianum,* Hook. t. 86.—Berteroanæ (Juan Fernandez). *Peperomia margaritifera,* Bert. t. 91.—*Blechnum pubescens,* Hook. t. 97.—Wallichianæ (East Indies). *Davallia serræformis,* Wall. t. 93.—*Gymnogramma vestita,* Wall. t. 115.—Cumingianæ (Columbia). *Lindsæa elegans,* Hook. t. 98.—Burchellianæ (Brazil). *Oligogyne Burchellii,* Hook. t. 101.—Dalhousianæ (Himala). *Asplenium Dalhousiæ,* Hook. t. 105.—Hallianæ (Columbia). *Thibaudia acuminata,* Hook. t. 111.—Wightianæ (Madras Peninsula). *Tephrosia suberosa,* W. et A. t. 120.—*Capparis incanescens,* W. et A. t. 123.—*Niebuhria linearis,* W. et A. t. 124.—*Pterospermum reticulatum,* W. et A. t. 125.—*Capparis brevispina,* W. et A. t. 126.—*Niebuhria oblongifolia,* W. et A. t. 127.—*Capparis pedunculosa,* W. et A. t. 128.—*Coccinia Indica,* W. et A. t. 138.—*Bauhinia racemosa,* Lam. t. 141.—*Sterculia colorata,* Roxb. t. 143.—*Shuteria glabrata,* W. et A. t. 144.—Drummondianæ (S. United States and Texas). *Andromeda phillyreifolia,* Hook. t. 122.—*Brachyris ramosissima,* Hook. t. 142.—*Gymnopsis uniserialis,* Hook. t. 145.—*Hymenoxys ? linearifolia,* Hook. t. 146.—*Brachyris microcephala,* D C. t. 147.—*Palafoxia Texana,* Hook. t. 148.—Eightsianæ (N. S. Shetland). *Aira antarctica,* Hook. t. 150.

In a late number (thirteen) of the Madras Journal of Literature and Science, our friend Dr. Wight has written some observations on the tree which yields the Camboge of Commerce, and these are offered in reference to the specimens received by Dr. Graham from Ceylon, and described at p. 193 of this Journal; so that we gladly introduce them as a supplement to that paper.

"I am induced," says Dr. Wight, "to request a place in the Madras Journal for the insertion of a few remarks on the tree which produces the Gamboge of Commerce, in consequence of the following observations on it by Dr. Graham, Professor of Botany, Edinburgh, communicated by him in a letter, dated 12th March, 1836. 'In consequence of having received specimens from Mrs. Walker of the tree which, in Ceylon, yields Gamboge, I have been attending to the subject lately, and on Monday last read some observations to the Royal Society of Edinburgh about it. I have been obliged to dissent wholly from Arnott and you, that it is the *Xanthochymus ovalifolius,* and Arnott now agrees with me so far, but he has

fallen into at least as great a blunder. It is undoubtedly, I think, the *Garcinia* (*Mangostana*, Gært.) *Morella* of Desrousseaux and Gærtner. Arnott now thinks it *Garcinia Zeylanica*, which it cannot be, if Roxburgh describes this with any degree of truth. In fact, the *Garcinia Morella*, which I have said it is, is no *Garcinia* at all. Murray says, the tree is *Stalagmites Cambogioides;* but his description will not apply to my plant, from which I have a great quantity of excellent Gamboge. I have sent a specimen of it to Mr. Don, requesting that he will compare it with the specimens in the Banksian Herbarium, from which Murray's description was taken. If it prove the same, the generic name *Stalagmitis* may be retained, and the description only altered. If not the same, it must form the type of a new genus, to which I find *Garcinia elliptica* of Wallich also belongs; it is especially characterized by the stamens, of which I send you a figure.'

"The point on which Dr. Graham finds it necessary wholly to dissent from us is thus briefly stated at page 102 of the Prodromus. 'There can now be little doubt of this *Xanthochymus ovalifolius* being the only plant in Ceylon yielding Gamboge fit for the arts; and that, consequently, the specific name of Linnæus, *Gambogia Gutta*, ought to have been applied to this species, and not to *Garcinia Cambogia*.' The evidence contained in Dr. Graham's letter seems so completely to invalidate the correctness of our statement, that it might appear useless to attempt any refutation; yet I am not wholly satisfied that he is either wholly right or we wholly wrong. I do not deem him right in supposing the tree of which he has got specimens to be the only one that produces Gamboge fit to be used in the arts, nor do I believe it is the one that produces the true Ceylon Gamboge. I entertain this opinion, because it has been long and well known that there are two sorts in use; one from the eastward, Siam, Cambogia, China; and the other from Ceylon; the latter considered inferior to the former. The Gamboge from the tree in question, specimens of which I have seen, is apparently of the best quality, and much superior to the common Ceylon Gamboge, having a fine rather light colour and a glassy fracture. The true Ceylon Gamboge is of a darker hue, and mixed with dark brown spots. The tree which produces the fine Ceylon Gamboge is rare, as Col. Walker informs me he has only met with it in one place, and that in an old garden near a former Dutch settlement, not far from Negombo. It cannot, surely, be supposed that a tree so exceedingly rare as this is represented, should be the one that affords all the Gamboge produced in the island; still less so, when it is borne in mind that the substance obtained from it differs in quality from what is usually produced there, and known in commerce under the name of "Ceylon Gamboge." From these facts I think we are entitled to conclude that Dr. Graham has drawn a wide inference from insufficient data; or, in other words, has attempted to form a general rule from a solitary example. I do not, however, wish it to be supposed, that I insist upon our statement being held as strictly correct; because a certain degree of uncertainty is attached to the tree or trees from which this substance is procured, which all the efforts of Botanists, for the last century, have been unable altogether to remove. All that I have attempted, or indeed wish, to prove, is, first, that the facts adduced by Dr. Graham are not sufficient to invalidate our position, that the *Xanthochymus ovalifolius* is the only *indigenous* plant in Ceylon producing Gamboge fit to be used in the arts, though I fear, from further enquiries, that we were premature in hazarding so strong a statement; and, secondly, that the tree from which Dr. Graham's specimens were procured is of exotic origin. I shall now attempt to account for the appearance in the island of that tree, which is neither a *Garcinia* nor a *Xanthochymus*.

"About the beginning of the seventeenth century, the Dutch first imported Gamboge into Europe from China, and, not

long after, they expelled the Portuguese from Ceylon, and formed settlements of their own there, which they retained until near the end of the eighteenth century.

"Is it at all unreasonable to infer that, in the course of that long period, they should endeavour to procure from their own territories a lucrative article of commerce, in place of having to purchase from others all of the finer sorts required for the European trade? If not, we may readily suppose they imported the plants above referred to, and which have remained unnoticed by the English, until Colonel Walker accidentally detected them about two years ago, in just such a situation as one might expect to find introduced trees, namely, in a garden close to a Dutch settlement. A most interesting discovery this is, since it seems to prove that they are of exotic origin; that the soil and climate are suitable for its growth and propagation; and leaves room to infer, that the tree might be introduced with success on the West coast, at least, of India, the climate of which corresponds, in many respects, with that of the South-West coast of Ceylon; and, lastly, because it sets at rest, in part at least, this long-agitated question, by making us acquainted with the probable source of the best Gamboge used in the arts.

"Botanically considered, this plant presents some points of considerable interest, which may be the means of directing more of the attention of Botanists to the peculiarities of the Order to which it belongs than it has hitherto received.

"Dr. Graham shows that his plant is not a *Xanthochymus*, neither is it a *Garcinia*, and, unless there is an error in the description, that it cannot be a *Stalagmitis*; but that it forms a new genus, essentially characterized by its stamens, the filaments of which are united into a single square column, and the anthers one-celled, opening at the apex by a calyptra, or lid, instead of two-celled, bursting longitudinally, as in all the other genera of *Guttiferæ*; characters amply sufficient to separate it from every other genus of the order.

"To the conviction expressed, that this new genus is undoubtedly Gærtner's *Mangostana Morella*, I can offer no objection; as I am altogether unacquainted with that plant, except through the figure, and because Dr. Graham does not state the evidence on which he grounds his conclusion; but if it should prove correct, I must acknowledge that it goes far to establish the fact that it is a native of Ceylon, and, consequently, that the juice of it, as well as of other trees, may be extracted for Gamboge, as that of *Garcinia pictoria*, Roxb. Another member of this new genus is in Malabar.

"Here the question must, for the present, rest; as it can only be finally settled by a reference to authentic specimens of the plants described by the older Botanists (who usually paid much attention to the useful plants), as the 'Arbor Indica *guttam gummi* fundens,' and which has now been bandied about from species to species till it seems to have multiplied itself into half a dozen different trees; but I trust that Ceylon Botanists will now be induced to take up the subject in earnest, and ascertain, by actual inspection and the preservation of specimens, the tree or trees (for there may be several) from which its Gamboge is derived; and further, to determine whether the trees which have given rise to this fresh agitation of the question are of indigenous or exotic origin."

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Indigofera hirsuta L.

Swan Sc

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Loxoma Cunninghamii.

Tab. XXXII.

Loxoma Cunninghamii.

Bauer Esq del.

Allan & Ferguson lithog